GAS JOURNAL

LIGHT HEAT POWER BYE-PRODUCTS

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EDITORIAL NOTES.

The Prestige of Tar.

In these times one of the great problems in industry, trade, and professional work is how to keep one's own end up. The reasons for this are that standards in every direction are higher and competition keener than before. But in industry and commerce recourse is sometimes had to much that is artificial, misleading, and illusory; and this it is very difficult to combat. False statements get abroad, and they become, by repetition, the subject of belief by people who have not the knowledge to refute them. They are spread by ignorance, and are accepted by the ignorant. Tar has been experiencing this. The bitumen people have worked cleverly. They have carried the tale of the prepotency of their commodity for road purposes into high and low places—into the political world, into Government Departments, into the motoring world, and into the spheres of professional road making, until many people have been imbued with the belief that it is an economy to use even the imported substance for road making and surfacing, that it prevents the pollution of rivers, and that road surfaces never had the equal that the exotic material has imparted to them. It was a remarkable transformation. Never before bitumen arrived had we heard so much regarding the vices of tar on roads. Prior to that, its economy was lauded; it was proved that it contributed to the making of good roads and improved their longevity. It was one of the greatest road economies that had ever been introduced. Little was heard of the premature decease of fish in our waterways; there was only modest complaint from motorists. The general view was that roads for motoring had never been so perfect; there were admittedly patches about the country where tar had been prepared and applied in a slipshod manner, and the results were not good, but were curable. All this good report was changed by diligent propaganda on behalf of bitumen and certain road constructing preparations.

It was for the coal-carbonizing industries to take-up the challenge; and through the Road Tar Committee, with Mr. H. C. Head as Chairman—a Committee representing the gas, coke-oven, and distilling interests—some unobtrusive, effective, controverting work has been going on; but it has to be carried on still more vigorously against the competitive interests arrayed before tar. The Committee developed into an Association; and the Association has just had its constitution ratified, which event was celebrated at a luncheon last Wednesday, at which Sir David Milne-Watson presided. This supplied an opportunity for giving information regarding the work before the Association, and of setting right a piece of injustice that had inadvertently been done to tar in respect of its legitimate sphere for road purposes. The incident shows the responsibility that attaches to those in high places to guard against making assertions which are not strictly accurate, or in such a way that they may be misinterpreted. Coming from a great statesman, a declaration (though technical in nature) obtains credence, is accepted as true by non-technical papers, and is given circulation. The injury may be infinite; anyway, it gives a great deal of work to those whose business it is—as it is that of the Association—to correct it. The difficulty is fully to counteract the mischief done. In the editorial columns of the "JOURNAL" last week, reference was made to the discussion in the House of Lords on River Pollution, and to the appointment of two new Committees to deal with the matter. In the course of the debate, the Lord President of the Council (the Earl of Balfour) made these remarks:

> There is one point on which—though I speak with diffidence on the matter—I think my noble friend [Lord Mildmay of Flete] somewhat exaggerated the evils of the present condition of things. I refer to the effect of our tarred roads upon the fish in the streams. What he said was perfectly true with regard to tar made from coal. But I understand that "Trinidad tar" does not contain the noxious substances which have such a disastrous effect upon fish life; and I confess that I think a local authority has no excuse for using, in the making and upkeep of our roads, any form of tar that is injurious to fish life when it is in a position to obtain tar which has none of these noxious properties.

The statement left in that form could do no good to home-produced tar, while it naturally favoured imported bitumen. It placed a weapon in the hands of those ignorant of the subject; and it supplied a fine testimonial to the bitumen people, which they would, had not prompt action been taken by the President of the National Gas Council, utilized to the full. Only the following day, "The Times," in an editorial article, commenting on the debate in the Lords, referred to tar as one of the "recent and menacing" sources of pollution," adding "many roads have now been made innocuous by the substitution of bitumen, but tar is still being used elsewhere." This shows how easy it is to traduce a commodity, and for the defamation to be adopted by others who are totally unqualified to pass an opinion upon it. On Sir David calling the attention of Lord Balfour to the matter, his Lordship (as it was well known he would) at once did the right thing by making plain the interpretation he intended should be placed upon his statement.

> I see (he wrote) that it is possible to interpret it as meaning that all roads on which tar derived from coal is used pollute our rivers. This is not, of course, what I intended to say. It is only the roads which border on rivers—a very small minority of all the roads in the country—which have an injurious effect upon fish life. Elsewhere the use of tar is, as might be expected, quite innocuous. I entirely agree with you in attaching such value to the maximum utilization of this most important product of our great coal industry.

Singularly enough, this important correction of a misinterpretation has not received in "The Times" the same prominence as the original defamatory statement.

Two points arise out of Lord Balfour's letter; and they were dealt with fully by the speakers at the luncheon. The first is, Why buy more imported bitumen than the quantity required (if it is really necessary) for the 5 p.ct. of the mileage of roads adjacent to rivers, and why not use the home-produced material for the other 95 p.ct., and with it get equally good wearing qualities and surfaces, which motorists agree are less slippery than are bitumen ones? The other point is that while our politicians and economists are urging everything possible to be done to assist the coal, steel and iron, and other industries, and to make fuel—smokeless fuel especially—for industry and domestic use as cheap as possible, there are these influences at work against tar which is an important product of British coal, and the purchase and profitable use of

which contributes to the very objects projected upon notice as being so highly desirable in the national interests. There is room here for the co-ordination of acts and advocacy. It is part of the scheme of operation of the new Road Tar Association carefully to watch over these things. Publicity in its various guises is another part; and another is research for improvement in material and in use—improvement to the extent of producing a non-toxic tar for the 5 p.ct. of the mileage where such material is needed. Still another part is demonstration. Tar is not dependent upon mere postulation; its producers are content to prove virtue. There is good work before the Association; there is confidence that it will be effective; and that in the result road authorities who have turned to the patronage of a foreign substitute will again observe, in this particular, the injunction of the President of the Board of Trade—"Buy British Goods."

"Come to the Fair."

Special attention is claimed for the British Industries Fair at Birmingham, which will be held from Feb. 20 to March 2 next year, because on this occasion there is a desire to give gas a truly representative display. It has to be admitted that for some years past, while exhibits of various methods of heating and lighting by coal, oil, and electricity have been prominently displayed, gas has been practically unrepresented. This fact has been commented on by distinguished visitors to the Fair; and it has been generally felt that our industry suffered from a lack of organized effort.

At a meeting of manufacturers of gas appliances and plant convened by the Society of British Gas Industries, and held at Birmingham on July 21, it was unanimously decided to ask the Fair Authorities to reserve a space in Building "A*a*," in which a properly constituted Gas Section could be arranged. A Gas Sub-Committee has been formed, with Mr. R. J. Rogers, the Chief Superintendent of the Fittings Department of the Birmingham Gas Department, as Honorary Secretary; and 5000 sq. ft. of space have already been applied for, and provisionally booked, in this section.

There is no doubt, now that provisional arrangements have been entered into with the Fair Authorities for a Special Gas Section, many firms who have not previously taken part in the Fair will wish to have space allotted to them. The demand for accommodation at the Fair in all sections is exceeding that of past years, and the provisional reservation which has been secured from the Fair Authorities is necessarily limited. It is hoped, therefore, that all firms interested will make early application, in order that every manufacturer connected directly with the gas industry may have his stand housed in one definite section. We feel sure that the Fair will then become a general rendezvous for buyers in the gas industry, in the same way that it has already become the venue for annual meetings of Electrical and other Associations.

In Defence of Gas-Oil Prices.

The "Petroleum Times" has recently published an article on "The Price of Gas Oil," and in its composition there are, it appears to us, rather contradictory features. In the first place, it refers to the complaints that have appeared in our columns regarding the charges for gas oil. It also points out that last year the imports of gas oil amounted to 117·04 million gallons—an increase of 44·39 millions on 1925. We may also mention, as affecting the argument which is developed, that last half-year (though there was then no scarcity of coal) the imports continued on the same high scale—being 58·96 million gallons, or an increase of 23·81 millions on the first half of 1926. Our contemporary admits that "the great abundance of crude oil and gasoline, and the low prices obtainable for them, naturally suggest that gas oil, as much a product of crude oil as gasoline, should be correspondingly cheap." That admission is followed by the statement that the matter is not quite so simple—two factors other than the demand of gas manufacturers affecting the market for gas oil. That submission supplies the ground for discussion.

Our contemporary in setting-out to put us right on this matter states what is no doubt absolutely true, that for most cracking processes it is more economical to use gas oil than the heavier oils, notwithstanding that the latter are the cheaper material—the percentage of gasoline obtained from the former being higher and the quality superior. Cheap gasoline, it is added, is due to the fact that a large proportion of the gas-oil fraction has been converted by cracking into motor fuel, "tending, therefore, to lessen the amount of gas oil available for other purposes, and to increase the gasoline available." We suggest that the implication is a slander on the oil people. The only meaning to be attached to the statement is that they have, with their eyes open, made the availability of motor spirit so great that they have had considerably to reduce the price, and have by their action lessened the amount of gas oil available for other purposes. Is that true? The "Petroleum Times" shows that never before has this country been so flush in gas-oil imports as it was last year; and the figures this year show there is no abatement in its "availability." The year 1925 may be taken as a normal one in respect of gas-oil use at prices which cannot compete with modern coal-gas manufacture; and in that year 61·38 million gallons satisfied the requirements of the statutory gas undertakings. Over that figure imports showed a surplus in 1925 of 11·27 million gallons. But compare that 61·38 million gallons with the delivery of 117·04 millions last year; and with the 58·96 million gallons delivered in six months this year. We cannot, without engaging in the folly of self-deception, reconcile with those figures our contemporary's statement as to the lessening of the amount of gas oil available. What the oil people are stupidly doing, if we interpret the submissions correctly, is to compel, on the one hand, the reduction of the price of motor spirit by cracking-up the gas-oil fraction, so causing over-production; and, on the other hand, by maintaining gas-oil prices, reducing its use for carburetted water-gas manufacture, so injuring this particular market.

After a reference to the gas-oil fraction being the most palatable for the Diesel type of engine, the argument proceeds to confirm the asserted curious procedure of the oil people. The statement is made: "There seems to "be no doubt that the oil interests find themselves "powerless to avoid unremunerative prices for their main "product—motor fuel—which will cut deeply into net "revenue; but [mark this you grumblers over the price "of gas oil!], with a better control of the gas-oil market, "it is possible that attempts are being made to make the "price of gas oil offset, to some extent, the low price of "gasoline. This kind of self-preservation is perfectly "natural and legitimate." The gas industry objects strongly to that sort of self-preservation. It resents having to contribute in this way, and at the expense of gas manufacture, to the provision of low-priced motor fuel; it objects to men being in control of such an important industry as oil who crack-up gas oil to such an extent that (so it is alleged) they are compelled to reduce the price of motor spirit, and try to make up their profits out of gas oil. It does not appeal to us as an altogether sensible way of doing things; and perhaps the oil magnates who are supposed to be concerned in these proceedings will agree with us.

Apparently our contemporary thinks those who decree the practices in the oil industry are doing a wise thing in overloading the market with motor spirit at a low price, and obtaining partial compensation for themselves by a high price for gas oil. The matter is in their hands; they must decide whether or not they are going to make it worth while the gas industry's manufacturing carburetted water gas on a larger scale, or seeing a decline of demand from the industry. The "Petroleum Times" counsels the gas industry to adapt its practices to coming events. It says: "In view of the other increasing demands for "gas oil, the gas-manufacturing industry must adapt its "practices accordingly, and would probably be wise to "abandon the expectation that gas oil will again become "as cheap as before the new uses for it had developed." And again, "it seems obvious that the recent trend of

oil technique is to increase the value of the gas-oil fraction of crude oil, and to bring its price into closer relationship with that of light motor fuel." Whence has come the great and constant flood of gas oil the last eighteen months? However, the gas industry will note the advice of our contemporary to abandon the expectation that gas oil will again become as cheap as before the new uses for it had developed; but we think the noting can be done without abandoning expectation. The excuses that are made for the high prices of gas oil (with the supply what it is) are, to put it mildly, rather thin.

In the Next Five Years.

As a rule, we are a little sceptical of prophets, but when the prophet happens to be in a position such as Sir Alfred Mond occupies—very much behind the scenes in our industrial, and particularly in our chemical, life, knowing intimately what movements are afoot—we cannot fail to be arrested by his utterances. In the account of an interview with him which has been published in the "Evening Standard," Sir Alfred has foretold that great changes in the chemical work of the country—changes undreamed of a short while ago—will take place during the next five years. We need not on this occasion discuss the highly polemical question of industrial combinations. In this as in most matters, circumstances alter cases. The big consolidation of chemical interests in this country with which Sir Alfred is so prominently identified—Imperial Chemical Industries, Ltd.—was largely due to his belief in the need for such combinations in the future development of any country in the world's affairs. When other countries are consolidating industrially, it is impossible for the smaller cognate units of any other country to meet them on equally influential terms. It was with the view of bringing into existence a body capable of conducting on advantageous terms negotiations with the chemical industries of other countries that Imperial Chemical Industries, Ltd., had birth. Sir Alfred tells us that negotiations are going on at the present time between that Company and the corresponding interests in other countries; and the former is, owing to the new organization, in a very strong position in relation to those negotiations, the object of which is mainly to attain an interchange of scientific knowledge and processes, by which means the good of the world can be best served. Of course, no country possesses a monopoly of brains, research, and discovery; and, no matter the source from which scientific information can be obtained which will help to make Great Britain as independent as possible of imported raw or manufactured materials, there will be indisputable advantage.

That by way of preface. It is what is going to happen in the next five years, according to the predictions of Sir Alfred, which peculiarly interests the gas industry. In considering these matters, however, it must be remembered that the developments of which he speaks in this country have their representation in other countries; and, therefore, such developments, so far as they concern the gas industry of this country, are equally important to the gas industries of other countries. In the first place, he spoke of the synthetic nitrogen industry, and predicted that, in the next five years, the production of artificial fertilizers in this country will solve the problem of the exhaustion of its land. The scale on which production of the synthetic article is proceeding at Billingham is nothing to what it will be, inasmuch as it is proposed (and we believe it has already got beyond the proposal stage) to extend the plant very largely. The interview informs us that experiments are proceeding at eighty farms in different parts of England, Scotland, Wales, and Ireland to test the new system of rotational grazing of grass treated with synthetic nitrogen; and under the system it is believed that animals can be kept on grass land in a healthy productive state for six months, and more of them than before on a specified acreage. This means an economy in milk production. Though bye-product sulphate of ammonia is affected, who can reasonably object to progress? It would have no effect if we did.

Another matter which has been kept prominently in view in the columns of the "JOURNAL" is the development of home-produced oil. Without advocating any specific plan whereby the gas industry could help in, and benefit through, oil production, we have simply urged that it is a problem which should be thoroughly explored to ascertain what part, if any, it can take, and to attempt to visualize what will be the position of the industry in respect of its secondary products if oil production is taken in hand here by other industries. Activity in this regard is being intensified. Sir Alfred is of opinion that, within the next five years, this country will be manufacturing large quantities of oil from coal. In Germany plants are being erected on a full commercial scale for this purpose. He does not say to which process he is referring; but we should have little hesitation in putting a name to it. The information he gives is that in this country the process will be developed on lines of equality with the Continent; and its exploitation, he believes, will relieve our depressed coal industry. As a matter of fact, preliminary arrangements have already been made for the working of the system here as soon as it is commercially possible, and the product will be marketed through the existing oil companies. In this connection, it is interesting to note that the "Evening Standard" has also had an interview with Lord Aberconway, who is likewise of opinion that in the coming five years big developments will take place here in the production of oil, which he similarly believes will be of considerable advantage to the coal industry. But whether or not he has in view the same process as Sir Alfred Mond, is not divulged, inasmuch as he speaks of the development of coal distillation at the pithead. Anyway, he has pleasant visions of the many millions of pounds which are now paid by this country for foreign oil being turned into the coffers of the British coal trade. The gas industry will find interest in reflecting upon the views of these outstanding industrialists. However, so confident is Sir Alfred Mond of the materialization of these developments, that he finds an analogy in the position of British Dye Industries, which organization is now capable of supplying the whole of our dye requirements. The great strides which have been made in that direction will be repeated in others, including the production of synthetic alcohol, which, if cheap enough, and brought into combination with benzole, would do much to relieve us of a great part of our reliance upon imported motor spirit.

There is a further interesting point in the account of this suggestive interview with Sir Alfred. He speaks of the co-operation of labour in industry being essential; and, in doing this, he mentions the formulation of a labour policy by Imperial Chemical Industries, based upon the principles of profit-sharing, works councils, welfare schemes, workers' shares, and co-operation in every possible direction. Through these means, he believes that it will be possible to maintain industrial peace and happy relations, as well as the personal touch between the employees and those directing the concern. There is nothing novel in these methods; but the statement reveals the convictions of a great industrial magnate that such relationships are imperative for the good of industry generally.

There is no question that we are living in moving times—in times in which large developments are taking place, which will ere long become part of our day-by-day system. There is something fascinating in contemplating them—particularly those which invade or border upon our own operations.

Mining and Undermining.

THE chief lesson to be derived from the Miners' Federation Conference last week in Southport is that the wreck of what was a potent force is still being led by singularly bad incompetence. It was not the Executive who were wrong last year; it was everybody else in the mining industry, in the political world, and elsewhere, and everybody else is still in the wrong. The Executive of the Federation are, of course, puritans and blameless. It was not they who ran on to the rocks the organization and all associated with it, and who laid to waste much of the fortune of the country, in the enjoyment of which the

miners and other trade unionists ought now to be sharing in common with the rest of the community. But people, after their experiences, decline to take the Executive of the Federation at their own valuation. They prefer to assess their value by their record; and a nasty record it is. Large masses of the miners are not in love with their leaders of last year, and have deserted from the Federation ranks. Other trade unions look at them askance, and have secretly, if not openly, appraised them at their true worth as leaders of men.

Reading the reports of the proceedings at last week's conference, it may be said with good assurance that the lessons of the past will never succeed in penetrating certain pates, and lead their owners from the irrational to the rational. What they fail to realize is that to redeem the past, they should do their utmost to help to pull the coal industry from the mess into which they have been largely instrumental in precipitating it. That is the road for the best effort and results for their own men. But their intelligence does not rise to this. We look through the address of the President (Mr. Herbert Smith) and the reports of the proceedings, and we see nothing constructive—only the old plans and nostrums which have done duty for years, which have led nowhere, and have done no good. The word "nationalization" stares at us from every few lines of print. It seems to be the one and only ambition, though nationalization has been proved a mischievous and wasteful thing where it has been tried. The coal industry, too, must be transformed from the single operation of coal extraction to a combination of that process and coal utilization—by the mines obtaining products from the coal, and by generating electricity. The additional riches to be obtained by these means must be utilized for improving the conditions of the miners. No one else matters. It is by absurdities of this kind that the Federation Executive hope to win back the affection of the whole of the miners.

Meantime, there is a modicum of satisfaction in finding that the Executive have at length realized that changes have been going on in coal production abroad, and that there is little chance now of our export coal trade reaching, unless something unforeseen happens, the dimensions existing in 1913; but they spoil this appreciation of an economic fact by asserting that the present position of the industry is due to wasteful and unnecessary competition. Why "wasteful," and why "unnecessary?" The disastrous operations of the Federation last year caused terrible waste for the mining industry and the country, and due to that certain action is now essential which might have been otherwise unnecessary. It is the cost of production that has to be lowered in order to bring the industry into a healthy state again. The Executive of the Federation prefer to attribute the present condition of affairs to the excess of supply over demand, due to the increase of the hours now worked. There would have been less demand and much larger excess of production if something had not been done to lower the cost. The Executive of the Federation cannot control the whole mining world. They would like to do so. Arrangements, they say, must be made with other coal-producing countries to end the present "murderous" competition—a competition, it is conveniently overlooked, that was intensified by the developments last year in production in other countries through the Executive of the Federation not being able to see beyond their noses. And what success did they have during the coal stoppage from their persistent but stupid endeavours to get other countries to cease their coal trading with this country—a "murderous" plan against this country, conceived and advocated by those gentry who are still kicking against adamant economic facts? We despair of ever seeing them learning sense. Their best developed capacity appears to be in the direction of calling people names, imputing to them motives which are altogether outside the range of their thoughts, and disowning any share in responsibility for grave happenings. One thing they would like to have would be a central coal-selling organization which would charge prices that would enable the miners to have better wages. The fact that high prices might in present circumstances greatly reduce demand and employment is an unconsidered trifle.

Of course, much was said at the conference about the Trade Disputes Act. It is all it should not be; it has bad intentions (though its authors never even dreamed of them). Therefore the work of the Trade Unions, according to the notions of some of the representatives of the miners, should be to defy the law of the land, and combine to render nugatory the new measure. And here we have a real bit of satisfaction. The more intelligent of the members of the Federation said plainly that little use would come from the unions combining, and calling a general strike. Even in the mining industry, they would not get the men completely out as they did last year; and Mr. Smith admitted that he was not prepared to lead them into a morass. It is a pity he was not of the same way of thinking last year. In this talk of action which would mean anarchy, the President scents an attempt to wreck the Federation, and he is not willing to be a party to revolution and destruction. Apparently he has become a convert to the more placid ways of constitutional procedure; but not so the minority of the Executive, headed by the flamboyant Cook. They want to merge the whole of the Miners' Unions into one National Union. This is a conception of the Minority Movement; and it is not acceptable to the President and the more sober-minded members of the Executive. In fact, it is seen that there is a definite break in the labour world between those who favour revolutionary tactics and those who—weary of strikes, destruction of the interests of industry, the promotion of unemployment, and such-like—are in favour of constitutional methods. It appears that even the General Council of the Trade Union Congress—still smarting under last year's impertinences of the gentle Tomsky, who gave them a sound Soviet flagellation for calling-off the general strike, and supplied them with instructions as to the ways they should go—are now proposing a clean cut with the Communists and Russia. The sooner they do this publicly and sincerely, the sooner will they set themselves right with the public after the senseless and illegal proceedings of May last year. In this relation, there are the efforts that are being made to stimulate interest in the splendid objects and work of the Industrial Peace Union, with which many prominent men in the industrial and labour world are identified. The propaganda of the Communists, supported by foreign money, has to be met by propaganda; and for this purpose the Union asks for £100,000 a year for the next five years. That amounts to half a million all told. The Miners' Federation collected and spent over 2 millions sterling last year, depleted their own and their associated unions' coffers, ran them into debt, squandered the savings of the miners, and led them into debt, and caused the country to suffer a loss in production computed at £300,000,000, to say nothing of the subsidy from the National Exchequer. The Industrial Peace Union ask for only £100,000 a year for a few years, which, looked at from the standpoint of the results of the troubles of last year, is a mere fleabite. It would be money well spent in a great and needed effort. If it only stopped the spread of the insidious poison of the Reds, it would be a small expenditure for a large gain. And it is time the country took strong counteractive steps against the men who are seeking to undermine our institutions through pernicious teachings and revolutionary methods.

Report on Mining Subsidences.

In later columns we give the salient features, so far as they concern the position of gas undertakings in mining areas, of the report of the Royal Commission on mining subsidences. The Commission have not seen their way to make any recommendations which would, if adopted, materially affect the situation of such works under the existing law.

The Cheapest Gas.

Middlesbrough has just made a reduction of the price of gas by 4d. per 1000 c.ft., which makes it the pre-strike charge of 2s. 2d. The "North-Eastern Daily Gazette" states that at this price "the borough can claim to supply the cheapest gas in the country." Probably this is the cheapest for ordinary consumers. But in Sheffield for the excess consumption be-

yond 500,000 c.ft., the charge is 2s. 2d. per 1000 c.ft.; for the excess beyond 3,000,000 c.ft., 2s. 1d.; for the excess beyond 6,000,000 c.ft., 1s. 4d. But for ordinary consumers, is there any other gas undertaking which can claim equality with Middlesbrough?

Trade Disputes Act.

In the House of Lords on Monday last week, the Trade Disputes Bill was read the third time and passed. It became an Act last Friday.

The Price of Coal.

In an interview which appeared in the "Evening Standard" last Tuesday, Lord Aberconway bemoaned the conditions which have brought down the price of coal to its present level; and he looks to a central selling organization for the whole industry to readjust matters according to his views. He distinguishes between central control and central selling. The former is impossible; the latter meets with his approval. The cutting of prices for the home as well as for the foreign market, in his opinion, is due to individual firms selling at low prices, and bringing others down in their train. Having regard to the fine quality of our coal, he is certain that the foreigner would not object to any reasonable price a cartel might decide to ask. This appears to be the means by which he thinks under-cutting in coal could be stopped.

Coal Grading, Sampling, and Analyzing.

At the recent Coal-Cleaning Conference in Edinburgh, Mr. F. S. Sinnatt, the Assistant Director of Fuel Research, read a paper in which he dealt with the sizing, grading, blending, and purification of coal. We discussed some of the points he made in our issue for July 13 (p. 82), particularly the one regarding blending in its relation to gas making. In his annual report (which has also previously been noticed), Dr. Lander, the Director of Fuel Research, makes reference to these matters. During last year it was, in view of the coal stoppage, impossible for the research staff to make any appreciable progress in the investigation of the methods of sampling large commercial consignments of coal; but now that the mines are again in operation, the investigation will be pressed forward, because the Fuel Research Board, very properly, regard the matter as of the utmost importance to the country, especially to the export coal trade. It is remarked by Dr. Lander that there are indications that one result of the coal stoppage has been greater realization among colliery owners and coal exporters of the importance of preparing, grading, sampling, and analyzing consignments of coal; and he regards as highly important the ascertaining of the effects of cleaning, grading, and blending of the various seams as at present carried out. With this end in view, samples are taken for examination in the laboratory of coals as dispatched from the collieries after treatment. The work is being pressed forward; but it is desired that it should be made clear that the ordinary commercial examination of consignments of coal does not fall within the province of the Board, and is not carried out by the staff. We quite agree that grading, sampling, and analysis are most important; but it must be insisted that any blending at the mines should be performed in consultation with the users, in order that satisfactory blends for special purposes may be realized.

Pre-War and Current Coal Exports.

When considering the figures given on a subsequent page regarding the coal exports for the first half of this year, compared with the last normal corresponding half-year (1925), it will be noted that the foreign coal trade was better in the six months this year—26,318,921 tons, as against 25,848,443 tons. But we have to go back to 1913 to see what a substantial shrinkage there has been in our coal business overseas through the development of coal production abroad, and the use of oil and water power. In the June half of 1913, the quantity of British coal shipped to countries abroad was 35,526,235 tons; thus in the six months this year 9,207,314 tons less were exported. Excepting Belgium, Holland, Greece, and Finland, all European countries took less coal from us last half-year than in the same period of 1913. We also sent over a million tons less to South America. This is no new thing; the shrinkage has been gradually enlarging—perhaps it has now got to its end. The "Iron and Coal Trades' Review" gives the average monthly f.o.b. price of coal for the six months ended June as follows: January, £1 0s. 11d.; February, 19s.; March, 18s. 5d.; April, 18s. 6d.; May, 18s. 4d; June, 17s. 10d.

Unemployment.

It seems difficult at the present time to keep below the million line in respect of unemployment in Great Britain. Since the beginning of last month, the total number of persons on the registers of the employment exchanges has been above the million. On July 4, the figure was 1,053,600; on July 11, 1,036,500; and July 18, 1,048,000. This last figure was 11,484 more than in the previous week, but 583,268 fewer than in the previous year, when the figures, of course, were affected by the miners' dispute. The 1,048,000 for July 18 was composed of 656,600 wholly unemployed; 329,100 temporarily stopped; and 62,300 normally in casual employment. Of the wholly unemployed, 538,900 were men, 20,300 boys, 76,200 women, and 21,200 girls.

FORTHCOMING ENGAGEMENTS.

[*Secretaries of Gas and Kindred Organizations are asked to assist in making this diary of events as complete and useful as possible by sending the earliest intimation of all meetings.*]

Aug. 16-17.—IRISH ASSOCIATION OF GAS MANAGERS.—Annual meeting at Cork.

Sept. 7-9.—NORTH BRITISH ASSOCIATION OF GAS MANAGERS.—Annual general meeting in Dumfries.

Sept. 13.—NATIONAL GAS COUNCIL.—Meeting of Central Executive Board.

Sept. 13.—FEDERATION OF GAS EMPLOYERS.—Meeting.

Sept. 22.—WALES AND MONMOUTHSHIRE DISTRICT INSTITUTION.—Meeting at Porthcawl.

Sept. 23.—SOUTHERN ASSOCIATION OF GAS ENGINEERS AND MANAGERS.—Visit to the Torquay Works of the Torquay and Paignton Gas Company.

Sept. 30.—EASTERN COUNTIES GAS MANAGERS' ASSOCIATION.—Annual meeting at Cambridge.

Oct. 3-5.—BRITISH COMMERCIAL GAS ASSOCIATION.—Sixteenth annual general meeting and conference at Southampton.

Oct. 27.—MIDLAND ASSOCIATION OF GAS ENGINEERS AND MANAGERS.—Autumn general meeting, Grand Hotel, Birmingham, at 2.30.

INSTITUTION OF GAS ENGINEERS.

Sept. 12.—Finance Committee.

Sept. 12.—Council meeting.

Sept. 12.—Visit to the Shipping Engineering and Machinery Exhibition at Olympia.

Sept. 13.—Education Committee.

Absence of Corrosion with Dry Gas.

Earlier in the present year, "Natural Gas" made reference to certain experiments which had been carried out in an endeavour to ascertain to what extent the drying of gas reduced the corrosion in pipes and meters. The gas regularly supplied to the city was first passed through a new tin meter, and then through a glass bottle in which it impinged on sulphuric acid, which partly filled the bottle. After this, it went through a second new meter similar to the first one. The test covered a period of 142 days, during which the meters passed 37,800 c.ft. of gas. At the end of this time, the first meter on moist gas had a hole in one diaphragm, both diaphragms were black, and the tin plates were corroded. The meter passing dry gas was in perfect condition. Experiments on a semi-commercial scale showed no internal corrosion from the effects of dry gas; while test pieces and meters exposed simultaneously to moist gas ahead of the de-humidifier were badly corroded. The writer of the article in question concludes with the remark that the results of several years' investigation and observation of conditions found in various parts of the distributing system appear to justify the conclusion that the interiors of mains and meters suffer practically no corrosion when exposed to dry gas—that is, when the dew point of the gas is below the lowest temperature reached in the system.

PERSONAL.

Mr. CHARLES WOOD, lately retired City Gas Engineer for Bradford, was the recipient, on July 29, of a presentation from the City Council, as an appreciation of his services for 46 years to the Gas Department. Unfortunately, as in the case of several previous presentations from various sections of Gas Department workers and staff, Mr. Wood's medical advisers would not allow him to be present personally; and he was again represented by his eldest son, Mr. A. W. Wood. The presentation, which was in the form of a handsome chiming "granny" clock, was made by the Lord Mayor of Bradford (Alderman Richard Johnson), at a gathering at the Town Hall of public officers and members of the Gas Committee, over which Alderman George Walker (Chairman of the Gas Committee) presided. There was general expression of regret at the fact that Mr. Wood could not personally be present, and that his health had not kept up so that he could have retired in the normal course of events in two years' time. Mr. Wood, who has now left the South Coast, where he was recuperating, and is at Harrogate, wrote expressing his deep appreciation of the kind thoughts of which this gift was an evidence, and said he would treasure it as a reminder of his happy associations with members of the City Council. The gift of such a clock, it is worthy of note, is particularly suitable in the case of Mr. Wood, who has long been a keen horological student. Years ago he used to check his time daily by a telegraphic time signal from Greenwich to Bradford; and as far back as 1912 he had a wireless receiving apparatus which gave him a daily time check.

Mr. EDMUND SHAUL, who for the long period of 45 years has acted as Gas Manager to the Penrith Urban District Council, has tendered his resignation, owing to continued ill-health. In regretfully accepting his resignation, Mr. J. G. Sim (the Chairman of the Council) eulogized the remarkable service of the Shaul family to Penrith. The present Mr. Shaul's father was, he said, Manager before him for a very long period; and they had seen many changes on the works. The gas sold had risen from 18 million to over 67 million c.ft. per annum; and the responsibilities of the position had increased considerably. Mr. Shaul had always shown the greatest attention to duty; and the best wishes of the Council went out to him in his retirement. The Council unanimously appointed Mr. JOHN CORRIGAN to the vacant position, with duties to commence on the 1st inst. Mr. Corrigan has acted as Assistant Manager on the works for the past five years.

Alderman GEORGE RATCLIFFE, leader of the Liberal Party in the Leeds City Council, who has accepted nomination as the next Lord Mayor of Leeds (under an arrangement by which the three parties select the Lord Mayor in turn), is quite well known among members of the gas industry, as his chief interest in Leeds public administration has been as Chairman of the Gas Committee, over which he presided for a good many years. He took more practical interest in gas manufacture and selling—including the work of the "B.C.G.A."—than most laymen may be expected to do. He took over the Gas Chairmanship in 1904; and at a time when the coal market was fluctuating very badly, it was largely due to his personal influence that the Department exercised a foresight in long-term contracts which saved the city many thousands of pounds.

Mr. FREDERICK WILLIAM EPWORTH, of Shipley, a Fuel Chemist in the employ of the Bradford Dyers' Association, Ltd., who has gained his B.Sc. in the recent London University examinations, was formerly a Research Chemist to the Richmond Gas and Meter Company, at Warrington, and while with that firm gained the "Sir Robert Hadfield" prize of £100 for an essay on the utilization of town gas in industry. Most of his preparation for the B.Sc. in chemistry, which he has been awarded with second-class honours, has been done in evening studies at the Bradford Municipal Technical College.

Mr. RIDLEY DIXON, who has been with Messrs. N. Hingley & Sons, Ltd., since the war, and who formed and managed for them the Netherton Coal Company, and subsequently was Managing Director of Sterling Coal and Supplies, Ltd., from its inception, has now joined the staff of Messrs. Lunt Bros., fuel contractors, of 13, Colmore Row, Birmingham.

Mr. JOHN E. DAW has been elected Chairman of Directors of the Exeter Gas Light and Coke Company in place of the late Mr. G. Hardy Harris. Mr. Daw is the head of a well-known firm of Exeter solicitors, and recently resigned the position of Registrar of Exeter County Court.

MOTOR ACCIDENT TO LADY DUCKHAM.

Information has been in circulation regarding an accident in which Lady Duckham was involved. Her friends in the gas industry will be gratified to learn that there is now no cause for anxiety. The accident occurred last Sunday week. Lady Duckham, her mother (Mrs. Peppercorn), Miss Marion Duckham, the chauffeur and his wife, and a maid, were proceeding in Sir Arthur's car from Havre to St. Jean de Luz, where they would have been joined by Sir Arthur and the other two children later in the week. Miss Marion was driving the car; and, when 40 miles from Havre, they overtook two cyclists, who were both on the wrong side of the road. Miss Duckham sounded the motor-horn, but neither took any notice. She then proceeded to pass them, when, without any warning, one swerved to the right, just in front of the car. She, of course, tried to avoid him, and, in so doing, the car ran into a ditch and collided with a tree. All the party were suffering from cuts and bruises (with the exception of Mrs. Peppercorn) and shock; Lady Duckham being the one to cause the most anxiety. Sir Arthur chartered a special aeroplane in the afternoon immediately he received a telegram from the hospital at Verneuil-sur-Avre. At the end of last week, we learned that the patients were proceeding satisfactorily; and it was then hoped that they would be moved to the American Hospital in Paris last Sunday.

OBITUARY.

JOHN T. SHEARD.

We greatly regret to learn of the death, on July 20, as the result of an accident, of Mr. John T. Sheard, Chief Chemist to the Sheffield Gas Company. He was knocked down by a tramcar, and died the same day from his injuries.

In former times, Mr. Sheard was well known to readers of the "JOURNAL," by reason of the contributions which he made to our columns, though his own name was not invariably associated with these communications. Sometimes he wrote under the pseudonym of "Owen Merriman." Looking back over old volumes, record is found of the fact that in 1891 he was Superintendent of the Bloom Street Gas-Works of the Salford Corporation. In April of that year, he accepted the post of Manager of the tar and ammonia recovery department at the Govan Iron-Works, Glasgow. He was appointed Chemist to the Sheffield Gas Company in July, 1895. Some eight years ago, he patented a process in connection with the manufacture of neutral sulphate of ammonia. The object of this method was, by the introduction of a simple modification of the ordinary working arrangement, to eliminate free acid from the resulting sulphate at practically no expense.

Mr. Sheard was a member of the Institution of Gas Engineers and a Fellow of the Chemical Society.

FUEL CONFERENCE, 1928.

Big Preparations.

The organization of a Fuel Conference in connection with the World Power Conference is an imposing matter; and, in view of the extensiveness of the arrangements, the work has to be taken in hand at an early date. There has been mention from time to time of the Fuel Conference which is to be held in London next year; and already we have received from Mr. M. W. Burt, who is Joint General Secretary with Mr. Sholto S. Ogilvie, information concerning the well-advanced preliminary arrangements.

The Conference is to be held at the Imperial Institute, South Kensington, from Sept. 24 to Oct. 6 next year. The Hon. Presidentship has been accepted by the Rt. Hon. the Earl of Balfour, K.G., O.M.; and Sir Alfred Mond is to be the President of the Fuel Conference. The chief participating industries are coal, oil, gas, and chemicals; and they are strongly represented through their nominees to the Fuel Conference Committee and the Technical Committee. Representatives of additional interested organizations will later be added to the Fuel Committee. The member countries of the World Power Conference are arranging to participate in the Fuel Conference to the fullest possible extent by the presentation of papers under the various headings of the technical programme, and by the attendance of representative delegations. In order to shorten the proceedings, and to focus the attention of the Conference on the most important aspects of the subjects to be covered, apart from exceptional cases, only authoritative reports from representative bodies in each participating country will be accepted.

It is noticed that among the members of the Fuel Conference Committee are Sir David Milne-Watson, D.L., President of the National Gas Council, and, also representing the same organization, Alderman J. H. Lloyd. Included in the list are also the President of the Institution of Gas Engineers (Mr. H. D. Madden), Mr. C. F. Botley, Sir Dugald Clerk, K.B.E., F.R.S., Dr. C. H. Lander, and Dr. E. W. Smith, the last-named being Joint Technical Secretary with Mr. E. J. Fottrell. Of the Technical Committee, Dr. Lander is the Chairman.

The technical programme is to be divided into five classes. (1) Solid Fuel; (2) Liquid Fuel; (3) Gaseous Fuel; (4) Fuel Utilization (General); (5) General Aspects. The divisions of the programme are: (1) Composition and Classification of Fuels; (2) Preparation of Fuels; (3) Storage, Handling, and Transmission of Fuels; (4) Utilization of Fuels.

ELECTRICITY SUPPLY MEMORANDA.

Eltham Revisited.

THE "Electrical Times" has informed its readers that the Eltham Housing Estate of the Woolwich Borough Council has been a thorn in the flesh of the gas interests ever since it was planned. From what we know of the position of affairs there, the Estate itself has not been a thorn in anybody's flesh; it is the electrical equipment that has been a thorn in the pockets and comfort of the occupants of the houses. In consequence, their attitude not long since was such a thorn in the sides of the Borough Council and those responsible for the Electricity Department that the latter hopped, with an alacrity that was amusing, from their then current charges to lower ones. That act gave justification for the grievance of the consumers that the all-in price of only 2d. for electricity for lighting and cooking and for the hire of appliances was too much for them. There could not have been a clearer acknowledgment of the truth of this than the rapid departure to the two-part tariff, which, it is easy to show, places the Eltham tenants—having regard to the charges including their equipment—in a preferential position over the other electricity consumers in Woolwich. An "Electrical Times" representative has been visiting Eltham, and has obtained some figures, to examine which is interesting. The change was made not because there was a desire to advantage the consumers who proclaimed their preference for gas, but because the despotic Labour-Socialist Council have a deeply-rooted aversion to private enterprise.

New Figures.

The new tariff consists of a fixed charge, based on £16 per KW. maximum demand of lamps installed, with a secondary charge of ½d. per unit for all electricity consumed. For standard equipment, the fixed charge, it is said, works out to 2s. per week; and this is collected by the Council's rent collectors. For standard equipment the fixed charge is therefore £5 4s. per annum, or £1 6s. per quarter. Payment for the energy consumed is through a prepayment meter. The great point made by our contemporary is as to what has happened to consumption since the change in tariff was effected. It only came into force on Nov. 1 last year. Taking the figures from Dec. 1, the end of February gives three months' experience. From our point of view it is not the consumption, but what it represents financially as a business proposition, that is the important thing. But regarding consumption, it must not be forgotten that the three months named were particularly fine ones for developing it—in view of the coal position, Christmas time, and wintry conditions. A table in our contemporary gives the figures for the consumption in nine houses, selected at random, on the Estate for December to February, 1925-26, under the 2d. all-in charge, and for the corresponding period of 1926-27 under the two-part tariff.

Case No.	Dec., Jan., Feb., 1925-26.			Dec., Jan., Feb., 1926-27.		
	Days	Units Used.		Days.	Units Used.	
		Actual.	90 Day Qr.		Actual.	90 Day Qr.
1	92	102	100	70	286	367
2	50	102	183	59	656	1000
3	115	239	187	63	326	466
4	57	183	353	53	860	1470
5	56	64	103	46	220	430
6	50	58	105	41	41	90
7	50	54	97	60	203	305
8	49	36	66	57	337	532
9	53	50	95	68	486	643
Units per 90 day qr. Total 1299 units						5303
Per house 144						590

Average increase in consumption per house = 310 p.ct.

The Figures Examined.

Now let us take the average consumption of 590 units per house for the three months ending February last. At ½d. per unit, they cost £1 4s. 7d., which, added to the £1 6s., makes £2 10s. 7d. for the quarter. Dividing this by the 590 units, we get an average price of 1·03d. per unit for electricity, hire of apparatus, maintenance, interest, sinking fund, and all the other outgoings connected with the business of electricity supply, including collection and clerical work. If we take the consumption in 53 days of one householder—the one consuming 860 units—it will be found that the ½d. per unit works out to £1 15s. 10d.; adding to this the fixed charge for a standard equipment of £1 6s., makes £3 1s. 10d., which averages 0·86d. per unit for everything associated with the supply. If for the same consumer we utilize the figure adjusted to a ninety-day quarter, we have a consumption of 1470 units, which at ½d. amounts to £3 1s. 3d. for electricity, *plus* the fixed charge of £1 6s.—making £4 7s. 3d. This averages out, on the 1470 units, to 0·71d. per unit—1·29d. less per unit than he paid on the previously existing 2d. tariff. In a second table, we have a summary of data relating to consumption, income, and expenditure on maintenance. We find from this that in the twelve months ending December last 724,588 units of electricity were consumed on the Estate. In the same period, the maintenance costs amounted to £546 1s. 8d., which averages 0·18d. per unit. If we subtract the 0·18d. from the 0·86d. per unit—the income per unit received from the householder using 860 units in 53 days—it leaves only 0·68d. per unit for electricity, interest, sinking fund charges, and other expenses appertaining to the supply. Deducting the same 0·18d. per unit for maintenance from the 0·71d., the average payment for the 1470 units, on a ninety-day basis, we have left only 0·53d. per unit to cover all charges. Our contemporary in its "Tables of Electricity Supply Costs and Records" does not give the generating costs, &c., for Woolwich, so that we are unable to make comparison with this figure of 0·53d. per unit. But this we do know (from another set of tables), that the ordinary tariffs for Woolwich are lighting, 6d. flat, and varying contracts, 2·9d.; heating and cooking, 1d.; power (combined domestic lighting, heating, and cooking), 2d.; all-electric, 0·8d. In view of these figures we wonder what the consumers of Woolwich who are paying 6d. for lighting, 2d. for combined lighting, heating, and cooking, or 1d. for cooking and heating, with 6d. for lighting, think of such charges at Eltham as 0·68d. and 0·53d. to cover electricity, interest, sinking fund charges, and all establishment expenses. It would be interesting if our contemporary would now write another article and justify the figures from the financial standpoint. The supply of these houses on the Eltham Eastate is not an hour-by-hour continuous load, but an intermittent one. We have no doubt the lighting and cooking habits of the residents are much the same, so that demand would be simultaneous; anyway the lighting would come on the ordinary lighting peak load. By the way, we suggest to the "Electrical Times"—it need not tell its competitors anything about this—that the volume of its advertisements would increase immensely if it reduced the price to (say) 5s. per insertion per page. Whether volume would supply financial justification for the step, we leave our contemporary to say.

Critic of the Scottish Scheme.

Much as the Government electricity scheme is looked upon doubtfully by numerous electricity experts as being something which will not fulfil expectations, there is a general feeling in the industry that what cannot be helped must be endured. So the pious resolution to make the best of a bad job has been fairly general. Even now there are some engineers who are not prepared to swallow everything that emerges from the Electricity Commissioners, and is faithfully endorsed by the Central Electricity Board—according to statutory plan. The Central Board are by legislation top dogs; actually, the Electricity Commissioners are still supreme. "A Supply Engineer" has been examining the Scottish scheme, and finds it wanting. The article which has resulted from his critical survey of the project makes doleful reading for those who were strong in the belief that much good was coming out of it. He does not like these schemes being thrust on to the industry without public inquiry. "This may be good policy for some of the parties concerned; it does not appear to be good policy for the electricity supply industry as a whole." And he asserts without fear or trembling that the burden of the huge outlay with which the industry is threatened will have to be carried in one shape or another by the industry, either—this is awful to contemplate—as an increased price of supply, or unsound finance. What has been urged before is submitted again—that, if the increased price of supply should coincide with the advent of a Labour Government, a specious case would be made out for nationalizing the whole electricity business—at any rate, so far as what may be termed the "wholesale" side of it is concerned. It is nothing but nationalization that is the objective of the Labour members of municipal bodies who advocate electricity for all. It is not with them economy, efficiency, labour saving, or anything in that category; it is the realization of a political ambition they are after—nationalizaton *viâ* municipalization. And they are desirous that even the compulsory use of electricity, as on the Eltham Estate, shall subscribe to this end. There are not a few of these autocratic individuals who are, out of consideration for their own economy, consumers of gas while compelling other people to be electricity users.

Financial Disaster Feared.

That by the way. "A Supply Engineer" shows how mythical is the idea that the cost of generation is going to be reduced in a manner which "will react quickly on the cost of energy to the consumer." Seeing that the cost of generation probably does not amount to more than 20 p.ct. of the total outlay for the supply of an ordinary

consumer, there would have to be an impossibly large economy in the cost of generation (and transmission and transformation) for the price to the consumer to be appreciably affected. He is concerned, too, about the voltage of 132,000 between phases for the overhead primary lines. In his opinion, the question for consideration is not how 132,000-volt transmission lines have stood up in Continental and American atmospheric conditions, but how they will stand-up in the island atmospheric conditions of Great Britain, which are peculiar and altogether different. In the Central Scotland area the transmission and transforming stations rendered necessary by the scheme are costed at 2¼ millions sterling. The annual charges on about 3 millions sterling for standardization of frequency, he places at £181,000, which burden will fall upon the electricity industry as a whole, as will the expenditure in the same direction for other areas. It is estimated by the Central Board that for the Central Scottish scheme alone £2,204,034 will have to be spent on transmission lines and transforming stations; and £2,921,250 on the standardization of frequency. In addition, owners of selected staitons will have to spend £850,000 on extensions—a total of £5,975,284. In his summing-up, the critic says the scheme, based upon highly theoretical and debatable estimates, will require the utmost skill of an unusually able Central Authority to carry it out without financial or technical disaster. There is a nasty thrust in the winding-up question: "When all is said and done, what are the advantages which the public will derive therefrom, especially the owners of the 6880 25-period motors connected with the Clyde Valley Company's mains? It certainly seems hard to discover in this scheme any reliable factor of financial safety.

Mishaps. Ernest Tennant, a foreman at the White Rose Dairy, New Earswick, near York, was engaged in one of his ordinary duties—looking after a hay cutter driven by an electric motor—when he fell, and was found to be dead. At the inquest on the 25th ult., an electrician stated that, on examining the machine after the accident, he found the wires had been broken. As the motor was not earthed, its casing would have a 250-volt current passing through it. Respecting the earthing, the Solicitor to the York Corporation (Mr. R. Anderson) stated that one of the clauses in their contracts required that anyone making additions or alterations to electrical plant should inform the Corporation, who would test it. The proprietor of the dairy mentioned that he had hired the motor from the Corporation every season for the last five years. This year he purchased it outright; and the Corporation knew he was having it installed. "Accidental death" was the verdict. There was some excitement in the Main Road, Darnall, Sheffield, on the 25th ult. Electric line testing was proceeding, when a wire fused, and an explosion occurred. Two men were badly burned. They were taken to the Infirmary, where one was detained, and the other allowed to go home, after having his injuries dressed. Following the explosion, a bedroom over a grocer's shop was found to be alight. Under the bedroom floor are a number of electric wires; and it is believed the trouble with the outside cable caused the mischief. There was failure of the electricity supply at Weymouth last Tuesday, owing to a workman accidentally piercing a main cable. The failure lasted an hour; the memory of the shock he had will last the workman the whole of his lifetime.

EDUCATION IN THE GAS INDUSTRY.

A Highly Successful Course.

In last week's issue of the "Journal," we published a photograph of those who attended a training course arranged by the Board of Education for teachers of Gas Engineering, Gas Supply, and cognate subjects, which was held at the Westminster Training College and the Westminster Technical Institute from July 16 to 22. It was attended by 21 teachers from Liverpool, Wigan, Huddersfield, Bradford, Birmingham, South Wales, Bristol, Reading, East Ham, Hackney, Tottenham, and Westminster. About half of them were specially released by their employers, and the others gave up an equivalent part of their holiday in order to take advantage of the course.

At the opening meeting on July 16, Prof. Smithells, C.M.G., F.R.S., took the chair, and the teachers were welcomed by Mr. A. Abbott, C.B.E., on behalf of the Board of Education, and by Mr. F. W. Goodenough, C.B.E., on behalf of the Gas Education Committee. Two afternoons were devoted to visits to the Technical Section of the Gas Sales Department of the Gas Light and Coke Company and to the Nine Elms Gas-Works; and the rest of the time was divided into three equal portions. One of these was occupied by lectures and discussions on methods of teaching, a second by blackboard and other forms of drawing, or to laboratory work in gas supply, and the third by lectures on special subjects by prominent men in or associated with the gas industry.

An Inspector of the Technological Branch of the Board of Education organized the course, and was responsible also for the work in methods of teaching. Mr. J. C. Brierley, M.Sc., A.M.I.Mech.E., supervised the drawing, and Mr. F. C. Smith took charge of the laboratory work. In the special lectures Mr. J. Stanley Thorman dealt with "Modern Practice in Carbonization," Mr. R. J. Rogers with "Modern Domestic Gas Appliances and their Installation," Mr. G. M. Gill, M.Inst.C.E., with "The Necessary Equipment of a Modern Gas-Works," Mr. Stephen Lacey, B.Sc., A.M.Inst.C.E., with "Technical Training in Gas Supply," and Dr. C. H. Lander discussed "Some Wider Aspects of Fuel Utilization, especially as affecting the Gas Industry." Mr. Thorman and Mr. Lacey spoke from the point of view of examiners, and Mr. Smith, of Tottenham, another examiner under the Scheme, also attended. The Chairmen for the special lectures were Messrs. T. Hardie, M.Inst.C.E., John Terrace, M.Inst.C.E., Samuel Glover, M.Inst.C.E., A. Abbott, C.B.E., and W. R. Davies, C.B.

Throughout the course the utmost keenness, enthusiasm, and good fellowship prevailed; and at a meeting held on the last evening the teachers expressed their high appreciation of the arrangements and of the nature of the work.

Ammonia Losses in Effluent Liquor.—A printer's error occurred in connection with the advertisement of the Chemical Engineering and Wilton's Patent Furnace Company, Ltd., on p. 202 of last week's "Journal." The correct reading of the second paragraph at the side of the illustration is as follows: "Ammonia losses in effluent practically *nil*."

PRIMARY DECOMPOSITION OF COAL.

Temperature of Initial Decomposition.

[Abstract of Fuel Research Technical Paper No. 16 of the Department of Scientific and Industrial Research.*]

The temperatures at which coals begin to decompose is of technical importance. What, however, is meant by "temperature of initial decomposition"? Apart from the doubt as to whether moisture and gases (probably occluded) driven off at temperatures below 110° C. should be considered as part of the coal substance, there is the further doubt whether decomposition may set in at a temperature lower than that at which vapours are given off, or whether some portion of the coal substance is driven off without any actual decomposition of any constituent of the coal. Moreover, the temperatures at which changes are observed undoubtedly vary with the precise conditions of the experiment. The investigation described in Technical Paper No. 16 was carried out by Dr. J. G. King and R. E. Wilgress to determine the temperatures of decomposition of certain coals under conditions which excluded influences other than heat; and it was decided that the evidence of decomposition should be the appearance of vapour or drops of an oily nature.

In gas and coke manufacture the question of the temperature of initial decomposition does not enter into the major operations, but in subsidiary processes it has an effect which does not appear to have been fully recognized. Thus, in the preheating of coal for the elimination of moisture, it has been assumed that a temperature of the order of 250° C. may be used. It is shown in the paper that such temperature cannot be employed without some change in the coal substance.

Conclusions.

The coals chosen numbered six, and were of the following types: Peat, lignite, bituminous strongly caking (Mitchell Main), bituminous medium caking (Dalton Main), bituminous non-caking (Ellistown Main), and anthracite. The results of the investigation show that coal, when carefully heated out of contact with free oxygen, decomposes to produce visible amounts of liquid oils at temperatures varying from 180° C. for peat to 215° to 245° C. for bituminous coals. This decomposition continues for some hours at least if the coal is maintained at the initial temperature. With bituminous coals the temperature of initial decomposition appears to increase with increasing oxygen content and decreasing carbon content. The evolution of water from coal in the absence of air is a gradual process, but with certain coals there are temperatures at which the rate of evolution is accelerated. With bituminous coals the first acceleration of moisture evolution coincides with the appearance of oil vapour.

* Published by H.M. Stationery Office, Adastral House, W.C. 2; price, 9d. net.

Midland Association of Gas Engineers and Managers.—The Autumn General Meeting of the Association will be held in the Grand Hotel, Birmingham, on Thursday, Oct. 27, at 2.30 p.m.

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BRITISH ROAD TAR ASSOCIATION.

TAR DISTILLING, COKE OVEN, AND GAS INDUSTRIES MEET AT LUNCHEON.

At the invitation of Sir David Milne-Watson, LL.D., D.L, a number of representative members of the tar distilling, coke oven, and gas industries met at luncheon, at the Savoy Hotel, Strand, W.C., on Wednesday last, July 27, upon the occasion of the constitution of the British Road Tar Association.

The chair was occupied by Sir David Milne-Watson; and seats at the top table were allotted to The Right Hon. the Earl of Dunmore, V.C., D.S.O., M.V.O., Mr. W. J. U. Woolcock, C.B.E., Mr. S. Henshaw, F.I.C., Mr. W. J. A. Butterfield, F.I.C., A.M.Inst.C.E., Mr. A. W. Smith, Mr. R. W. Foot, O.B.E., Mr. Escott E. Wood, Mr. E. S. Shrapnell-Smith, C.B.E., F.C.S., Mr. J. H. Ellis, Alderman Chas. Bird, C.B.E., Mr. H. D. Madden, M.Inst.C.E., M.I.Mech.E., Mr. M. H. Kellett, Mr. W. A. Lee, C.B.E., and Mr. R. T. Nugent.

The Loyal Toast having been submitted from the Chair,

Sir DAVID MILNE-WATSON said: I am pleased to welcome you here to-day to meet members of the coke oven and gas industries. My object is two-fold. First, to pay a well-deserved tribute to those gentlemen of both these industries, and also of the tar-distilling industry, who, by their joint endeavours during the past eighteen months, have done so much to lay a firm foundation for the British Road Tar Association; and, secondly, to celebrate the ratification of its constitution.

USEFUL SPADE-WORK.

I am sure we are all agreed that we owe a deep debt of gratitude to the representatives from the three industries who, under Mr. Head's able chairmanship, have done so much useful spade-work in preparing the ground in such a way that the British Road Tar Association will be in a position to commence operations under the most favourable auspices. I can assure you, from my own personal knowledge, that a very great deal of the most painstaking and conscientious work has been done by these gentlemen in furthering the cause which we all have at heart—namely, the steady use of British tar for British roads.

TO EXTEND THE USE OF BRITISH ROAD TAR.

As you will be aware, the principal objects of the Association are to encourage and develop the use of refined tar for road purposes, and to organize a campaign of publicity regarding its manifold uses in this connection. Simultaneously, it is proposed to organize and undertake additional research and experiment for the purpose of extending the use of British road tar, and generally, by means of an educational campaign, to convince both road makers and road users of the economic benefits accruing—not to them alone, but to the country in general—from the use of tar. It may be asked: "Why should it be necessary to-day to set out to extol the virtues of tar?" "Surely," it will be said, "the experience of the past thirty years has firmly established tar as an ideal road making and road surfacing material." Indeed, I cannot do better than quote the authoritative report of the Royal Commission on the coal mining industry—namely, that the bye-products of carbonization "have rendered possible the great improvement in the highways that has resulted from the treatment of road surfaces with tar." Immense quantities of tar are so employed to-day—approximately, half-a-million tons. But the very fact that it has proved so successful ever since it was first used, has led to its virtues being taken for granted; and little or no publicity has been given to the fact that tar is just as capable of meeting the exacting requirements of the road maker of to-day as it was of satisfying the conditions obtaining when it was first employed on roads. The Joint Tar Committee has been largely engaged in bringing this fact prominently to the notice of highway authorities and road users; and it will form part of the work of the British Road Tar Association to continue to disseminate this knowledge.

The immense increase in the volume of road traffic which has taken place since the war years has called for a programme involving not only the building of wider and additional highways, but vastly improved methods of construction. This great post-war programme, for which large funds have been specially allocated, naturally attracted the attention of those interested in other materials suitable for road construction. Widespread publicity has been given to the various applications of those materials. I do not criticize this publicity. What I wish to point out is that the absence of any sustained publicity campaign in regard to tar has led a large section of the public into the erroneous belief that, with the changed circumstances, tar has ceased to be able to fill the rôle which it has hitherto filled, and that newer and more suitable materials have arrived to take its place. That is a most unfortunate delusion, and I know of none more calculated adversely to affect, from the economic standpoint, the scheme of road construction to which this country is now pledged.

AN IMPORTANT BRITISH INDUSTRY.

I have already suggested that the increased use of British tar for road purposes will prove of economic advantage to the country in general. I say this advisedly. Tar, as you are all aware, is one of the main products of the carbonization of coal. The two industries engaged in the carbonization of coal are the coke oven industry and the gas industry. These two industries are essentially British industries, maintained by British capital and maintaining British labour, and dealing with British raw material. Again, the secondary process—namely, the distillation of tar—is entirely in the hands of British firms. It is therefore throughout a British industry; and it does appear to be somewhat anomalous that, whereas a practically unanimous vote is accorded to (say) an Empire Marketing Week, yet there are still to be found advocates—including on some occasions even the Press—of the use of foreign materials in place of British material as good as, if not better than, the imported article, and at the same time cheaper. Let everyone rest assured that, with the resources, equipment, and organization at the disposal of the British Road Tar Association, it will be possible to place on the market as suitable and as inexpensive a material as any in existence to-day.

LORD BALFOUR'S VIEWS.

In these circumstances, it was indeed somewhat unfortunate that at the time when this Association was coming into existence, an eminent Minister of the Crown highly respected by all of us—namely, Lord Balfour—in the course of a debate on the Pollution of Rivers, made statements which were capable of the interpretation that local authorities should in the future refrain from using British tar for roads. Owing to the somewhat misleading inferences that can be drawn from the phraseology used by Lord Balfour, certain sections of the Press not unnaturally jumped to the conclusion that he was advocating the use of imported road materials in preference to British tar; and certain prominent journals definitely advocated the preferential use of such imported materials. I do not propose, even if I had the knowledge, to give an address on the pollution of rivers; but I must very briefly touch on this subject, as I think I can in a few words lay the "bogey" which has been raised—namely, that of the many sources of pollution, one of the most recent and menacing is the use of tar on roads.

It gives me great pleasure to be able this afternoon to read to you a letter which I have just received from Lord Balfour, in reply to one in which I drew his attention to the effect that his speech in the House of Lords might have on this great British industry of tar making. It is, I think you will agree with me, quite a worthy letter from such a great man:

July 26, 1927.

DEAR SIR DAVID MILNE-WATSON,

In reference to your letter of the 22nd, I have referred to the report of my speech in "Hansard," and I see that it is possible to interpret it as meaning that all roads on which tar derived from coal is used pollute our rivers. This is not, of course, what I intended to say.

It is only the roads which border on rivers—a very small minority of all the roads in the country—which have an injurious effect on fish life. Elsewhere the use of tar is, as might be expected, quite innocuous. I entirely agree with you in attaching much value to the maximum utilization of this most important product of our great coal industry.

If you think it worth while, you are quite at liberty to publish this letter.

Yours sincerely,
(Signed) BALFOUR.

Really, it is a handsome letter, which at any rate shows that Lord Balfour certainly had not in his mind any injury being done to British tar. He did not know of this lunch; but I am very pleased he has given me permission to read this letter to you.

INSIGNIFICANT POLLUTION BY ROAD TAR.

It is admitted on all sides that the amount of pollution caused by road tar is in itself insignificant in comparison with other polluting agencies—notably sewage and industrial effluents. But further—and this is a vital fact almost invariably overlooked when reference is made to this subject—the Joint Committee on Damage to Fisheries appointed by the Ministries of Transport and Agriculture apprehended danger from pollution in the case of those roads *only* which drain *directly* into fishing streams. What proportion of the roads of this country drain directly into fishing waters? The proportion is practically negligible, about 5 p.ct. of the total road mileage of this country. In those few cases, we do not propose—nor shall we propose until further research work has enabled us to put forward an absolutely non-toxic tar—to advocate the use of tar on those stretches of road. The fish of the country can feel perfectly satisfied as to that. [Laughter.]

Bearing this fact in mind, can anyone with any sense of proportion or fairness suggest that any useful purpose can be

served by advocating the use of imported materials upon the remaining 95 p.ct. of road mileage? I have no hesitation in saying that anyone with a knowledge of the facts is doing a great disservice to British industry, and thus to the country at large, in discouraging the use of a British product admirably adapted for the purpose. It must be remembered that any restriction upon the use of any one of the products of coal carbonization must immediately cause a serious repercussion upon those great industries primarily dependent on the other products of carbonization, and thus detrimentally react upon the coal industry itself. ["Hear, hear."]

"Buy British Goods."

I was very gratified to see the statement made in the House of Commons last Monday by the President of the Board of Trade, when he said:

> The policy to encourage people in this country to buy British goods was a very sound one. The more it could be carried out, the less the margin in the adverse trade balance was going to be. Incidentally, it would mean more people at work, and possibly more money for developing other markets. . . . We must consider the home market a great deal more.

I am therefore taking this opportunity of asking the Government for fair play for our home industries. I feel sure we shall get the help of the Press in this matter. I would ask them actively to assist industry in this country by letting it be known widely that there is to-day a home product which is in every way suitable for roads of every description, with the exception at present of that minute percentage which drains *directly* into fishing waters.

Government Should Conduct Experiments.

As an industrialist, I was, as I have already said, very gratified to read the statement by Sir Philip Cunliffe-Lister; but I should like to emphasize the truth of the old adage that "An ounce of practice is worth a ton of precept." It is not as if the road tar industry were asking the Government for any financial assistance, or even for a protective tariff to be imposed in its favour. We are merely asking the Government to avail themselves of the opportunity which now presents itself of themselves putting into practice the policy they advocate. They have, under the Roads Improvement Act, authority to conduct experiments for the improvement of the construction of roads. We suggest that they should conduct experiments to ascertain the extent to which tar, properly prepared, can profitably be employed. I may say that this Association of ours will be willing and ready at all times to place its knowledge and experience at the disposal of the Ministry. We are ourselves satisfied that British tar, properly mixed with other British materials, and properly laid, is capable of producing as good results as those obtained from any other material; and we are confident that the Ministry's experiments should leave no room for any suggestion that it is necessary to rely upon the importation of foreign materials in order to make British roads the best in the world.

Tar Makes the Best and Safest Roads.

In this connection, I should like to emphasize one particular aspect of the problem of road making. Not only does tar make the best roads, but it also makes the safest roads. ["Hear, hear."] All who drive their own cars know the anxiety involved in driving on a wet day over the super-slippery surface of some of the most recent of our new roads, and the relief they experience when they reach a stretch which is covered with a black, roughish-looking material which, while as smooth to drive upon as the slide which they have left, makes them feel at once that the danger of skidding is over. That roughish-looking surface is tarmacadam; and if there were more of it throughout the country, accidents from skidding would be enormously reduced in number. This question of motor accidents, be it noted, is one which deserves the most anxious consideration by every highway authority throughout the country.

Prosperity to the New Association.

Now, having, as I hope, laid for good the "bogey" to which I have referred; having established that it need not deter the Government from applying to tar, both in word and deed, their slogan of "Buy British Goods;" and having indicated that we who represent the road tar industry are ready at all times to demonstrate the faith that is in us—that tar is second to none as a road making and road surfacing medium—there is nothing left for me to do but to thank once more all those who have worked so hard and achieved so much for the industry in the past, and to wish all prosperity and success to the newly-born Association, which, uniting, as it does, in one body all the varied interests engaged in the production and marketing of tar, will, we know, carry on the work which has been so well begun, and secure for road tar the universal acknowledgment of its merits. I give you the toast of "The British Road Tar Association," coupling with it the names of Mr. Woolcock, of the Association of British Chemical Manufacturers; Mr. Henshaw, of the Staffordshire Chemical Company; and Mr. Head, the Chairman of the Joint Tar Committee.

The Tar Distilling Industry.

Mr. W. J. U. Woolcock, C.B.E., replying to the toast on behalf of the tar distilling industry, said: Sir David Milne-Watson knows better than anyone in this room exactly what are the facts of the case with which he has dealt. Moreover, he has dealt with these facts very fully. There is not a single point he has missed, and nothing he might have referred to which he has not referred to. It only remains for me, therefore—apart from expressing my personal thanks for the kind way in which this toast has been received—to support what he has said. We are all of us very much interested in the formation of the British Road Tar Association. I emphasize the word "British," as Sir David has done. It really represents the effort of manufacturers in this country. The history of tar production, of course, is very typical in some respects of the history of British effort. Every characteristic with which we are endowed can be found among those who are representative of the British tar industry. We began, as we always do begin in this country, with a product which was more or less a waste product—a product which is fortuitously produced in large quantities, and for which some use must be found. History goes on, and uses are found for it, in one direction and another, until finally we arrive at the employment of tar on roads. Then, in the typical British way, knowing that tar is the best product that can be used on our roads, we do not bother very much to tell anybody about it. We just go along and supply it, and everybody finds it useful. The demand grows and grows to such an extent that competitors spring up with other materials which might possibly, in certain circumstances, be useful on roads. [Laughter.] They are rather powerful competitors. They have control of a weapon which we ourselves are not experts in using. They have the inclination to use, not only the great mammal, but even the little fishes. Nothing is too great or too small for them to adapt to their kind of propaganda. I am rather proud of the use that has been made of the little fishes. I am not quite so proud of the accident which has dragged in one of the greatest of our British mammals; but certainly the use of the little fishes has been very delightful. It is a "bogey," as Sir David has said. When you realize that only 5 p.ct. of the roads directly drain into a stream where these little fishes are, it is extraordinary that the great British public can almost unhesitatingly be led to think that tar on roads is killing all the little fishes in the country. It is really a part of our rather sloppy sentiment. We have much more consideration for the poor little fishes than for the lives of the great mammals.

"Trinidad Tar."

Personally, I feel that the British Road Tar Association has a very great work to perform. It has got to get rid of loose phraseology. That has got to go. I am delighted to hear the letter of Lord Balfour. I was cut to the quick to think that he could have used the expression "Trinidad tar" in his speech in the House of Lords. That, of course, has a wonderful sound. Trinidad tar from the Empire! What does it matter whether it comes from the heart of the Empire, so long as it comes from the Empire itself? Everybody who heard or read the speech feels that it is something we can be proud of if it comes from the Empire. Now, how much tar comes from Trinidad? I do not know; but it has a fine sound. This is the sort of loose phraseology which I think the British Road Tar Association will have to do something to combat. We have, it seems to me, also another mission. We must not only combat loose phraseology, but we must very deliberately set ourselves to deal with road tar in a scientific manner. I would refer to certain experiments which were conducted at Alresford, in Hampshire, some time ago, which were the subject of a report that had a great effect upon the tar industry. So far as the scientific work is concerned, I have not a word to say. I am perfectly content that, given the particular tar which the authorities used, given the particular piece of road, and given also a little extraneous assistance in the shape of a heavy thunderstorm, the finding of the Scientific Committee could be no other. But let us carry science a little further. Let us remember that there is a science of jurisprudence—a science equally as necessary as the science of chemistry—and that we should insist upon knowing something beforehand about the different qualities of tar to be used. We should require to know the circumstances in which these tars were to be put upon the road; and we should require to know something about the road material with which the tar was to be mixed, and various things of that kind.

Nothing Better than British Road Tar.

And this brings me to my second point. Not only are we prepared to say once and for all something that we have all known but which has not been public property—that British road tar is certainly as good as, if not better than, any other road material—but we are prepared to go further. We are prepared to say that this British product might not be perfect

under every condition in which it could be used, but that we are willing, in association with the Government, in association with any Technical Committee which the Government may appoint—granted that the scientific basis for the experiment is correct, and granted also that the circumstances and the surroundings in which the tests are to be made are correct—to combine and to give our fullest possible assistance to the Government, and once and for all demonstrate, in the only way in which it can be demonstrated, that our product is equal to any other product which the Government may care to authorize to be placed upon the roads. ["Hear, hear."] As Sir David has said, we feel entitled, owing to the line which the Government have taken, to go to the Government and say: "Your declared policy is 'Buy British goods.' We ask you a simple thing. We do not ask you for any State assistance. We do not ask you for any favour of any kind. We ask merely the right to demonstrate to you, and to the people at large of this country, that we have a home product which provides a very great number of workers with their daily bread—a home product which is essential, not only for the particular purpose we are discussing to-day, but which is essential to the general prosperity of the commercial industries of this country—and which challenges comparison in every possible way with anything that can be brought against it."

The Coke Oven Industry.

Mr. S. HENSHAW replied for the coke oven industry. He said: My chief duty is to thank you very much for the kind reception you have given to this toast, and to say on behalf of the coke oven industry, which I represent here to-day, that we do hope, in conjunction with the gas industry and the tar distillers, to put this road tar question on a good sound footing. We do feel that we have the right goods to sell. They are British goods; and if we can only get a fair chance, we shall be able to do all that is necessary. The Chairman told you that about half a million tons a year of road tar is now being used; but, gentlemen, we want it to be a million tons. ["Hear, hear."] I suppose that half a million tons will not represent even the production of road tar by the gas industry, to say nothing about the coke oven industry. I should think that altogether the combined work of the gas industry and the coke oven industry is probably accounting for between 30 and 40 million tons of British coal per annum; and this represents a huge industry employing a tremendous amount of British labour. I am reminded of a similar occasion to this some ten or more years ago, when we talked about another product from coal that we were at that time in difficulties about. We were producing a tremendous amount of benzole for which we were anxious to find a market. After we had that little meeting and discussed the matter with the gentlemen of the Press, our fortunes entirely changed. Instead of experiencing a difficulty in getting rid of our product, we found we were able to sell more than we could produce. We want the same assistance now. The coke oven industry is fully associated with the gas industry and the tar distilling industry in this matter. We are producing practically the same amount of tar as the gas industry; and we do very much want this market. It is necessary for us to make the best use of our bye-products, if British industry is to maintain its place in the world trade; and to this end it is essential that we should have the support of the British Press. A good trade in road tar means cheaper steel for the country. The trouble now is that British steel is too costly to produce; but if we are able to make a better use of our tar—and road purposes is one of the uses we want to make of it—we shall be in a position to turn out British steel at a cheaper rate. If the coal, iron, and steel industries are not right, everything is wrong. It is only by the best use of our coal and of our products that we are going to put the Empire and British trade in their proper position in the world. In these days, no matter how good an article is, unless you advertise you cannot sell it. Mr. Head, the Chairman of our Committee, has had more work than anybody else in bringing the scheme to the state it is now in. If our road tar is given a fair chance to show what it can do, we shall not be afraid of any competition. We do say it is as good as any material; and a great point is that it is produced at places all over the country, so that it is procurable without difficulties of long transport. On behalf of the coke oven industry, I undertake that we will do everything we can to see that the tar we make for use on British roads shall be the very best.

The Joint Tar Committee.

Mr. H. C. HEAD, M.Inst.C.E.: I do want to express, on behalf of the Joint Tar Committee, our sincere thanks to Sir David Milne-Watson for all the support he has given us. The Committee have now finished their work; and the British Road Tar Association is now constituted. The Association are to hold their first meeting in September, when the Committee will report. We look to the Association to do very much more than we have been able to do. If we have ploughed the ground, we look to them to scatter the seed. The Tar Committee have regarded Sir David as a sort of "Fairy Godmother" right through the last eighteen months; and when we have been in a difficulty, and wanted that "golden coach" to carry us a little farther on our way, we have referred to Sir David for means of transport, and he has always assisted us. I hope, on behalf of the Committee, that Sir David will fully understand our appreciation of, and our gratitude for, all that he has done. I should like to emphasize Mr. Henshaw's reference to the importance of the tar industry in connection with the coal, iron, and steel trades of this country. I want everybody in this room to appreciate the value of the bye-products in rendering our main products capable of competing in the markets of the world. If we are to turn-out our main products at the lowest possible price, we must do everything we can to reduce costs. With regard to the British Road Tar Association, the Prime Minister, in a letter which he sent to the recent Advertising Exhibition at Olympia, laid stress upon the fact that all parties must work hand-in-hand in order to get their goods in the best possible manner on the market. That is exactly what the Association has been formed to do. Our business is propaganda work, and to place before the public the true facts with regard to a British product for British roads. It is not our intention to force-up the price of our material so as to increase the cost of roads and transport in this country.

Confident of Encouragement.

One other matter I should like to mention is that we have succeeded in securing the co-operation and goodwill of the Ministry of Agriculture and Fisheries. The officials of the Ministry and their technical advisers have formed a Committee for the consideration of road tar questions. We were invited to attend, and were received with the greatest courtesy, and encouraged to come to their deliberations. We were told that there was to be a permanent Committee formed to advise on these matters, and that we should be invited to be members. I think, therefore, you will agree that we have gone a very long way indeed. I feel sure the Road Tar Association will receive every encouragement in its work, provided it does not—as it does not intend to do—increase prices. Another point is that we have had several meetings with the county and the municipal surveyors—those gentlemen who are responsible for the actual roads throughout the country—and we have, I think, established friendly relations with them. We have discussed our problems; and I feel sure that the new Association will have no difficulty in co-operating with the surveyors in carrying forward the good work. With the assistance of the Association and of the Press, we shall have better opportunities of placing our wares before the public; and the Press and the public, I am confident, will not be unmindful of the great motto: "Buy British goods."

The Chairman.

Mr. E. J. G. GEORGE: I should like to propose the toast of "The Chairman." I have been tremendously interested in the speeches, and especially in the appeal to patriotism. I hope the public at large, and the surveyors in particular, will take notice of what has been said. I have met Sir David in many places; and he has always dealt with matters in the most businesslike way. On this occasion he has "touched pitch," and he is "undefiled." [Applause.]

The CHAIRMAN: I hope this gathering will have very good results, and thank Mr. George for his kind remarks.

INSTITUTION OF CHEMICAL ENGINEERS.

Names Included in Recent Elections.

Members.

Thomas Alexander Wilson, F.I.C., Chief Research Chemist, Glasgow Corporation Chemical Works.

Rowland Walker, Manager, Gaythorn Gas-Works, Manchester.

Edward Escott Wood, General Works Manager, Brymbo Steel Company, Ltd., Brymbo; President of the Coke Oven Managers' Association.

Associate Members.

Richard Burt Robinson, B.A., Deputy General Works Manager of the Midland Tar Distillers, Ltd., Birmingham.

Charles Clitsome Smith, B.Sc., Superintendent, Gas Light and Coke Company's Tar Works, Southall.

Royal Society for the Encouragement of Arts, Manufactures, and Commerce.—This month a selection of the designs received in the Competition of Industrial Designs, 1927, for prizes and scholarships offered by the Society is being exhibited in the Indian Pavilion of the Imperial Institute, South Kensington. The exhibition, which is open free of charge, includes designs in architectural decoration, textiles, furniture, printing and book production, china, earthenware, and glass, as well as designs for posters, showcards, price lists, &c. A bureau of information has been established at the Royal Society of Arts in connection with the competition, at which are kept the names and addresses of exhibitors who desire to obtain employment as designers. These lists are at the service of manufacturers in search of designers.

CANADIAN GAS ASSOCIATION.

PAPERS READ AT THE ANNUAL CONVENTION.

(*Continued from p. 219.*)

KOPPERS NAPHTHALENE SCRUBBERS.

The removal of naphthalene and gum-forming constituents from gas was the subject of a paper prepared by Messrs. Powell, Merritt, and Byrne, who described the latest type of naphthalene scrubbers of the Koppers Company—apparatus in connection with which, it is claimed, considerable progress has been made during the last two years in the direction of simplification of design and automatic features. The naphthalene and gum-forming constituents are absorbed from the gas by light gas oil; the amount of oil required for efficient scrubbing being low, and the reduction in the heating value of the gas too low to be measured.

This naphthalene scrubber consists essentially of two parts—a primary or re-circulating section, and a secondary or fresh oil section. In the larger plants, the secondary section is mounted on the primary section in a single tower. In the smaller plants, or where it is undesirable to employ a tower of considerable height, the two sections may be in separate towers, or may be combined in a single tower having a vertical partition separating the re-circulating compartment from the fresh oil compartment. This latter type of construction is particularly adapted to small plants, and was designed for this purpose by the Western Gas Construction Company.

In the single-tower apparatus (as installed at the plants of the Seaboard Bye-Product Coke Company and the Chicago Bye-Product Coke Company), where the fresh oil section is superimposed upon the re-circulating section, gas enters the scrubber near the base, and passes, counter-current to the oil flow, first through the primary or re-circulating oil section. Next it passes through the secondary or fresh oil section, and finally through the gas outlet, near the top of the tower. The apparatus is provided with a special packing designed to ensure the intimate contact between gas and oil necessary for effective scrubbing, and at the same time to give very little back-pressure.

Small amounts of fresh oil are periodically distributed over the packing in the upper section. This oil passes slowly downwards through the fresh oil section; being spread out by the enormous surface of the special packing employed. The final scrubbing of the gas is effected in this section. On reaching the bottom of the fresh oil section, this oil enters the primary section, and joins the oil which is there being constantly re-circulated at a relatively high rate. The re-circulating oil drains into the sump at the base of the tower, whence it is again pumped to the top of the re-circulating section.

The naphthalene and gum-forming constituents of the gas are reduced by the re-circulating oil to an amount which can be entirely removed by the fresh oil in the upper section. The oil from the upper section, furthermore, continually freshens the re-circulating oil, so that the efficiency of the lower section remains practically constant. Spent oil from the bottom of the re-circulating oil sump is discarded at a regulated rate, so that the height of the oil in the sump remains fixed at the desired level.

The quantity of fresh oil used is so small that it is impossible to obtain satisfactory distribution with any system of constant flow. Hence the fresh oil is charged periodically in small quantities, but at a high rate, through a manifold or spray-header, to the individual sprays. Automatic means have been devised for controlling the deliveries, both as to volume and frequency. The fresh oil introduced into the upper section of the scrubber eventually joins the re-circulating oil, both freshening it and increasing its volume. An overflow is provided for the re-circulating oil sump, so that a constant level of oil will be maintained there. The overflow connects to the bottom of the sump, so that any water condensed from the gas, as well as excess oil, will be removed. Water and excess oil drain to a spent oil storage tank. Here the water is removed by a steam siphon connected to a pipe reaching to the bottom of the tank. When the oil level is reached, the siphon action automatically ceases. The spent oil (containing naphthalene and gum forming constituents), if not utilized, can be sold at a price at least equal to the cost of the fresh oil. A great advantage of the Koppers naphthalene scrubber is the very small amount of back-pressure it throws.

DRY QUENCHING OF COKE.

An abstract of a paper entitled "Advantages and Disadvantages of Dry Quenching of Coke" has been prepared for publication elsewhere in the "JOURNAL." The author was Mr. A. M. Beebee, of the Rochester (N.Y.) Gas and Electric Corporation, and he dealt particularly with the Sulzer plant.

"T.I.C." TAR DISTILLATION PROCESS.

A paper prepared by Mr. C. O. Condrup, B.Sc., of the Research Section of the Woodall-Duckham Company, on "Tar Distillation by Means of the 'T.I.C.' (Lead Bath) Process," was read by Mr. W. H. Memory, of the Isbell-Porter Company. It contained much valuable data in relation to this particular system, which has already been described in the pages of the "JOURNAL."

APPROVAL OF APPLIANCES.

In accordance with the report and recommendations of a Special Committee (unanimously adopted by the Association), in future American-made gas appliances that have been approved by the Testing Laboratory of the American Gas Association will, on application to the Canadian Gas Association, be given Approval Seals bearing the endorsement of the Canadian body. Gas appliances made in Canada will not be approved by the Canadian Gas Association until the appliances have received certification of approval in the Testing Laboratory of the American Gas Association.

(*To be concluded.*)

NOTES ON NEW BOOKS.

COAL CARBONIZATION.*

This treatise on the principles and processes of manufacturing coke and semi-coke is an admirable work, characterized by thoroughness. It is a book written by a man who has intimate knowledge of his subject, both theoretically and practically, and who is not afraid of expressing his opinions. Because of this, "Coal Carbonization" is constructive and stimulating, and will prove of value to all interested in the important problem of the treatment of raw coal. Moreover, the manner in which the author has set out his views and those of others is refreshing. The orderly sequence of thought will please the scientific mind, and the personal treatment will stir the scientific imagination.

Commencing with the origin of coal and of anthracite, the author passes on to consider why coal should be carbonized. He states that, in an anthracite field containing 100 ft. of coal, about 20 million tons of combustible gases per square mile have been lost. "That this fact has not been fully appreciated is evidenced by the continued use of the raw material—proximate coal—in the wasteful manner so prevalent in many countries, not the least in Great Britain. The value of the lost gases ... exceeds £50,000,000 per square mile, which figure may also represent the value of the gases which may be obtained from bituminous coal during carbonization."

A short chapter on the early history of carbonization is followed by a full consideration of the principles underlying the coking process, to which seven chapters are devoted. Then low-temperature carbonization is dealt with; successful and unsuccessful plants being described, for, as the author says in his preface, "if low-temperature processes are to be successfully developed, it is essential that investigators and inventors should profit from the experiences and failures of others." Examples are given which illustrate how progress has been retarded through lack of appreciation of the experiences of earlier workers.

There are twelve chapters on high-temperature carbonization, nine of which are devoted to coke ovens, and three to gas-works practice. With regard to the latter, the subject matter is thoroughly up-to-date, and includes a description of the "W-D" intermittent chambers at Ramsgate. There are two more chapters. One deals with the manufacture of semi-coke in bulk. The system proposed is the employment of efficiently heated narrow ovens operating under high-temperature conditions—with flue temperatures up to 1400° C., or higher. Blends of coking and non-coking coal, with or without coke breeze, should be used, and the charges should be pushed when the temperature in the middle reaches about 600° C. Owing to the fact that volatiles would be coming off in quantity during the discharging operation, it would be necessary to discharge into suitable chambers. The author states that "the employment of intermittent vertical chambers working at high temperatures is also likely to prove successful for the manufacture of semi-coke." The final chapter reviews briefly the Bergius, Patart, and Fischer processes for the production of oils from coal; and the book is terminated by a call for co-operation between rival carbonizing firms.

* "Coal Carbonization: High and Low Temperature," by John Roberts, D.I.C. Published by Sir Isaac Pitman & Sons, Ltd.; price, 25s. net.

COMPLETE GASIFICATION: PRODUCTION OF HIGH C.V. GAS.

(*Concluded from p. 223.*)

The remainder of M. Freyss' paper was devoted to a careful examination of the theory of tar cracking as applied in the "Kreisa" plant, and to a thermal balance-sheet. He states that the subject of tar cracking has not hitherto been the subject of much study, but that the most advantageous temperature range for the purpose is 700° to 800° C. He cites the researches of Bone and Coward, who found that of all the gaseous hydrocarbons methane is the most stable, for not until the temperature passes 1100° C. does it split up into hydrogen and solid carbon. Further, its decomposition seems only to take place at points of actual contact with the container. The same cannot be said for other hydrocarbons, such as ethylene, acetylene, and ethane, which at 800° C. display appreciable cracking; the following table showing the composition of the mixed hydrocarbon gases which result from one and five minutes' exposure of 100 volumes to the temperatures shown.

800° C.	Ethane.		Ethylene.		Acetylene.	
	1 Min.	5 Mins.	1 Min.	5 Mins.	1 Min.	5 Mins.
Acetylene (volumes).	1·9	1·2	3·0	3·2	25·9	7·3
Ethylene ,, .	11·2	4·4	57·2	21·4	4·2	2·7
Ethane ,, .	17·9	2·4	3·3	5·0	2·7	0·7
Methane ,, .	31·3	54·5	29·4	53·4	15·0	35·3
Hydrogen ,, .	37·7	37·5	7·1	17·0	52·2	54·0
1000° C.						
Acetylene (volumes).	2·5	0·6	3·5	0·35	13·85	1·85
Ethylene ,, .	6·9	1·8	8·7	1·65	2·05	0·35
Ethane ,, .	5·5	1·1	..	..	..	..
Methane ,, .	32·6	41·9	54·7	48·35	19·10	20·60
Hydrogen ,, .	52·5	54·6	33·1	49·65	65·00	77·20
1150° C.						
Acetylene (volumes).	..	trace	..	0·50	..	0·3
Ethylene ,, .	..	..	..	1·75	..	..
Ethane ,, .	..	..	..	..	..	..
Methane ,, .	..	27·0	..	25·20	..	21·3
Hydrogen ,, .	..	73·0	..	72·55	..	78·4

It will be seen from the above that not one of the gases named can resist for more than 5 minutes a temperature of 1000° to 1200° C., with the exception of the methane formed by secondary reaction.

It is more or less the same with all the tar hydrocarbons; and it is easy to understand the difficulties which have been met in practically every attempt to crack tar by injecting it in liquid form on to a bed of incandescent coke or coal, at a temperature too high or irregular. The treatment of tar fog in a checkerbrick chamber maintained at the correct heat is, however, a different matter; and stable gases are obtainable at a high process efficiency.

The effect of the carburation was clearly shown by taking samples, at two stages of the make, at the inlet and the outlet of the superheater; the later samples being fully analyzed as well as tested for calorific value. The results are tabulated. It is seen that the cracking of the tar meant an average increase of 450 to 500 calories [50 to 56 B.Th.U.]; and that

—	Sample 1.		Sample 2.	
	Inlet.	Outlet.	Inlet.	Outlet.
C.V. dry at 0° C. and 760 mm.	3130 cal. 352 B.Th.U.	3570 cal. 401 B.Th.U.	3220 cal. 361 B.Th.U.	3710 cal. 417 B.Th.U.
P.ct. analysis—				
$CO_2 + H_2S$	6·9	6·2	8·2	7·8
C_nH_m	0·5	1·6	0·7	2·2
O_2	..	..	..	..
CO	..	..	29·1	27·6
H_2	..	..	50·5	47·5
CH_4	..	..	7·1	10·7
N_2	..	..	4·4	4·2

the process resulted in an addition to the methane and heavy hydrocarbons, and a diminution of free hydrogen. The author rightly points out that the samples taken by no means represented the average composition of the make over a whole run, in view of the fact that far more water gas is produced at the commencement of the run. However, the figures give a true evaluation of the cracking, as the samples were taken simultaneously on each side of the superheater.

M. Freyss then examines more closely the reactions which take place in the "Kreisa" plant; and this brings him to the statement that 100 cub.m. of the enriched gas comprise 75·7 cub.m. of water gas, 20·3 cub.m. of coal gas, and 4·0 cub.m. of tar gas—equivalent, respectively, to 2555, 6140, and 11,500 calories. The final section of the paper contains carbon and steam balances and the various calculations which enable the following balance-sheet to be compiled.

Thermal Balance-Sheet—100 *Kg. Basis.*

—	Calories.	P.Ct.
Credit—		
Sensible heat of coal	400	..
,, ,, ,, water	860	..
,, ,, ,, blast	1,570	..
	2,830	0·4
Latent heat of coal	722,000	99·6
Total heat supplied	724,830	100·0
Debit—		
Sensible heat of dry gas	30,000	..
,, ,, ,, water vapour in gas	12,690	..
,, ,, ,, tar vapour	2,000	..
,, ,, ,, chimney gases	30,680	..
,, ,, ,, ash	290	..
Total	75,660	10·5
Latent heat of dry gas	448,600	61·9
,, ,, ,, water vapour	21,150	2·9
,, ,, ,, tar	35,920	5·0
,, ,, ,, chimney gases	38,650	5·3
,, ,, ,, carbon in ash	19,110	2·6
Difference—radiation, &c.	85,740	11·8
	724,830	100·0

This balance-sheet shows a thermal efficiency of 61·9 p.ct., or 66·9 p.ct. if account is taken of the calories in the tar recovered.

THE GERMAN COKE OVEN GAS SCHEME.

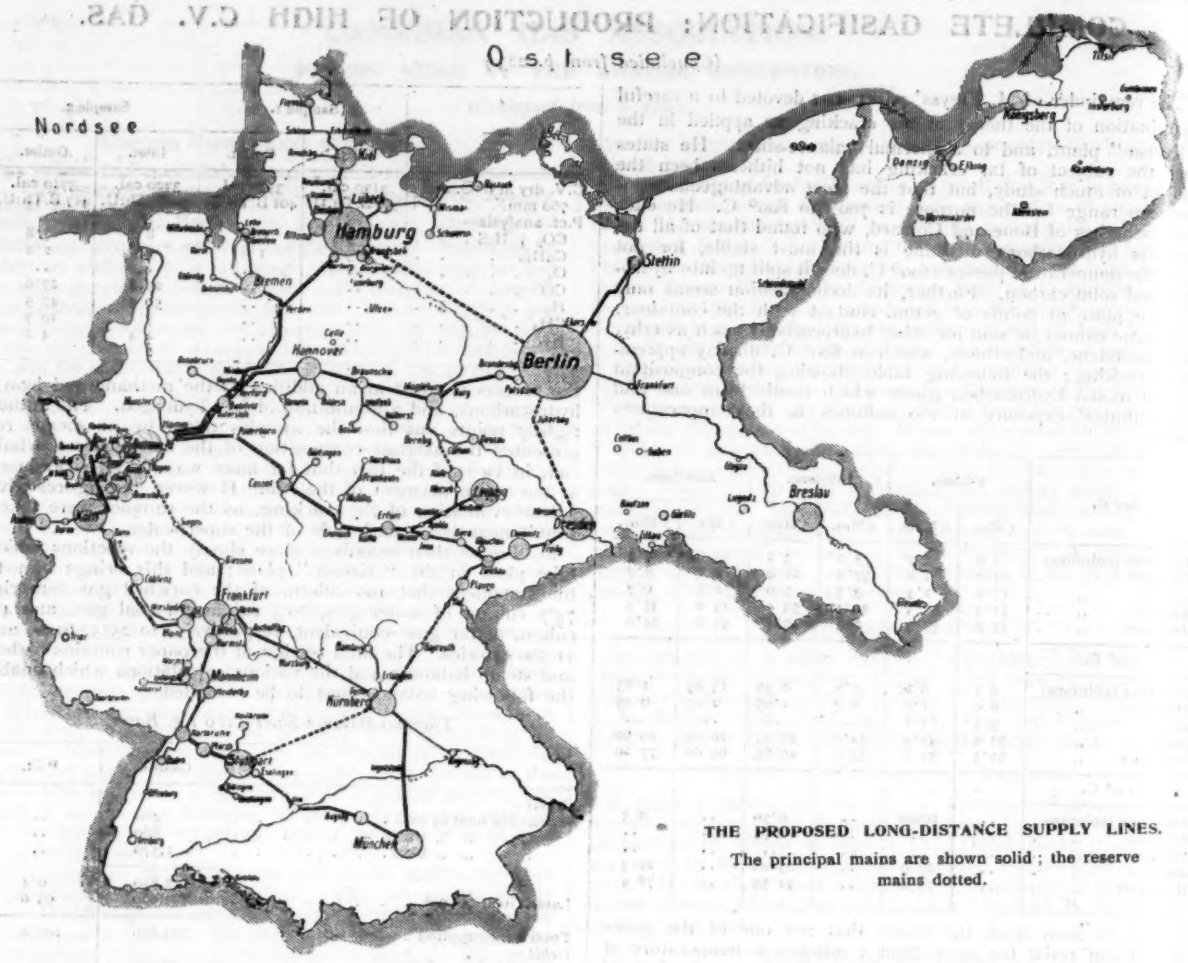
WE have endeavoured so far to keep our readers in touch with the various developments in the gigantic scheme by which the colliery interests in Germany are proposing to abolish a large proportion of the present gas industry in favour of supplies, under high pressure, of coke oven gas made at the pithead. The situation is arousing considerable interest in this country in both technical and political circles. We are able, in the following article, to summarize the paper read at the recent German Association meeting by Herr Müller, of Hamburg, and published in full in "Das Gas- und Wasserfach," for July 16. It supplies interesting details of the technical side of the scheme, and criticizes it from the gas industry's point of view.

In his introductory remarks, the author briefly traces the past development of the gas industry up to the present time, when the chemical problems of coal utilization, and the continual effort to improve upon the methods of its treatment, have become foremost questions of the day. It cannot be denied, he says, that only in large-scale and well-organized works can the best be got out of it; but no agreement has yet been reached upon the question of the size, and consequently the number, of the units which can most economically deal with the coal to be treated. In dealing with the proposed centralized supply of gas from the Ruhr coalfield, it must be realized that it would imply the complete closing, as producers, of all gas-works lying on the lines of supply.

As regards the economics of long-distance supply, naturally conditions are more favourable the greater the quantities to be carried; and points at great distances can only be cheaply supplied when consumption is proportionately great. Transmission costs are low when the compression station can be worked unintermittently for a more or less level load. In general it may be said that anything more than 3 pfennigs per cub.m. [approx. 10d. per 1000 c.ft.] is out of the question, and that the prospects are most favourable when an area of large consumption is situated at the end of the supply line.

THE SCOPE OF THE SCHEME.

Details of the scheme were first revealed by the promoters—the A.-G. für Kohleverwertung—in December last, and, as described, they constitute the ideal scheme, at least from the suppliers' point of view. The plan includes, for a start, all parts of the country which are at all favourably situated; the principal districts excluded being East Prussia and Upper Silesia. To be also excluded are the large number of small places which show a comparatively small gas consumption, and which do



THE PROPOSED LONG-DISTANCE SUPPLY LINES.

The principal mains are shown solid; the reserve mains dotted.

not lie directly on the main lines of supply. The present consumption of those places which are embraced in the scheme amounts to two milliards of cubic metres [over 70,000 million c.ft.], and their situation, and the hugé scope of the plan, are shown in the map; the size of the circles being proportional to the gas consumption of each chief town. It will be seen that three of the main distributing lines are from Hamm, and that there is one from Hamborn along the Rhine valley via Frankfort to Stuttgart and Munich (München).

Technical Difficulties.

Undoubtedly, if all the main cities on these lines gave up gas production, conditions would be as favourable as possible for the coke oven gas scheme. But there are many considerations to be taken into account before such a decision could be arrived at. To begin with, the standard gas made almost universally by the German gas-works, and to which consumers' apparatus of all kinds are tuned, is between 4200 and 4500 cal. [472 to 506 B.Th.U.] heating value with specific gravity 0·46. Naturally a gas of similar quality would be required from the coke ovens, whereas the gas they contemplate offering is of 4700 cal. An enormous capital outlay on water gas plant for dilution at the source would therefore be required, and this has, apparently, not been included in the estimates.

It is intended that large holders should be erected near the boosting stations, in order to keep the balance between make and consumption. The gas is to be delivered into collecting mains free from tar, ammonia, and benzole, but it will have to undergo further purification from naphthalene and sulphuretted hydrogen before compression. Here again, difficulties are likely. Ordinary naphthalene extraction by washing with tar oil would not suffice, as the naphthalene content must be below the vapour pressure of the naphthalene. This would be 5 grammes per 100 cub.m. at low pressure. But in this case pressures up to 30 atm. [441 lbs. per sq. in.] would have to be used, at which not more than 0·3 gramme per 100 cub.m. would remain volatile in the gas, and anything above this would cause endless trouble in the distributing system. Something other than present known methods of naphthalene extraction at low pressure would therefore have to be found, since present methods certainly do not attain to the required efficiency.

With regard to sulphur purification, a very high standard would be required before the coke oven gas would be acceptable. The author estimates the requirements at 150 purifiers at Hamm and 75 at Hamborn, and rather humorously pictures a double row of them three-quarters of a mile in length, or approximately the same length as Berlin's most famous street—Unter den Linden. No other purification process is as yet proved, though it is granted that developments in other directions are promising, notably one using activated carbon, and another which works at high pressures, but requires very large quantities of water. The promoters have recently made known that they have been successfully experimenting with a wet purification process. It remains to be seen whether this will achieve the standard that is demanded. No difficulty is anticipated in the matter of boosting, on which subject a great deal is already known.

On the basis of the estimated consumption, and an initial pressure of 20 atm. [294 lbs. per sq. in.], it is proposed that the Hamm-Hamburg and Hamm-Saxony mains should be of 500 mm. [20 in.] diameter, Hamm-Berlin 700 mm. [28 in.], and Hamborn to the South 600 mm. [24 in.]. It is estimated that the whole of the mains, including laying, would cost 325 million marks [about £16¼ million]. Allowing 10 p.ct. for interest and amortization, but not including any charges for compression, purification, and storage, the transmission costs would amount to 2·2 pfennigs per cub.m. [approximately 7½d. per 1000 c.ft.].

The author considers, taking everything into account, that, from the technical point of view, the project would probably prove practicable. There are, it is true, still difficulties in the way, but it is reasonable to suppose that they would not be insuperable. Presumably one main only would be constructed to begin with, and extensions proceeded with in the light of experience gained.

Advantages to the Coal Industry.

The gas production which it is proposed to take away from the gas undertakings may be estimated to correspond to 4·8 million tons of coal a year. In the past, half this coal has been supplied by the Ruhr, and the balance by Upper and Lower Silesia, Saxony, the Saar, and England. Though other coalfields are claiming a share of the spoils, the plan at present propounded, being the conception of the Ruhr interests, rather naturally envisages the whole supply as coming from the Ruhr mines. This would necessitate finding another outlet by mutual agreement for the other coal. This, however, should not be difficult, as it is considered that the Ruhr could, with the scheme in being, effect practically a total exclusion of English coal. This is cited as the principal economic advantage of the project to Germany.

Another gain to the Ruhr would be the solution, in large measure, of the small-coal problem. Smalls have been a bad

market of recent years, and, accumulating in heap, they deteriorate rapidly, especially in coking value. They could, in future, be coked immediately at the pithead; and coke in storage does not deteriorate to anything like the same extent.

The article next goes in considerable detail into the question of the financial gain which would accrue to the Coal Syndicate. A conservative calculation gives the result that an estimated present profit of 2·4 million marks from the sale of coal to gas-works would be increased to between 20 and 25 million marks under the new scheme. In addition to this, the competition of German gas coke and of English coal imports would be largely eliminated. The Ruhr would, before long, have practically a monopoly of the most important fuels. Moreover, the mains, if well laid, would have a life of at least 50 years. They would be written-off entirely in 20 years, so that, after this period, the above estimated profit would be at least doubled, and still further increased by any advances in sales of gas. It is easy to understand the enthusiasm of the Ruhr for the scheme.

The Position of the Gas Industry.

As regards the attitude of the gas industry, the situation must be judged purely from the economic standpoint. Like all other German industries, it suffered terribly from the war, and even more than most from the difficulties of the post-war period. On the other hand, it has been among the foremost in recovering, and has made tremendous advances during the past few years both in technique and in organization. The first fruits of these efforts are to be seen in a considerable reduction all round in production costs in both the large and the medium works. In this, of course, the cost of coal has been a factor, but modernization of plant and improved selling organization both for gas and bye-products have been the general order, and in the case of some of the large cities results have been exceptionally good. This does not apply, however, to the smaller and some, at any rate, of the medium works. Various estimates have been made of the additional coal consumption entailed in the production of gas by uneconomically working units; the author puts it at 700,000 tons. The elimination of this waste is no doubt a problem of national importance, but its solution does not lie in the closing of gas-works in general, in favour of a high-pressure supply of coke oven gas, at any rate upon the terms suggested.

Some of the Suggested Conditions.

The Company propose to sell gas to the communities at prices varying from 4·8 to 6·4 pfennigs per cub.m., according to the quantity they can take, but irrespective of their distance from the source [this is about 1s. 4d. to 1s. 9d. per 1000 c.ft. of 528 B.Th.U. gas]. Four conditions are, however, attached, which could on no account prove acceptable to the gas undertakings which are to cease manufacturing.

1. The area to which each town may supply gas is to be exactly defined and not on any account exceeded.

2. Towns must contract for an exactly defined quantity; and any excess requirements above this may only be covered by taking a further quantity of coke oven gas. Once the percentage of the contract quantity to the total sales of the undertaking has been increased, the increase must be maintained.

3. Large consumers within any undertaking's area of supply are to buy gas direct from the A.-G. für Kohleverwertung, if the latter desire it.

4. Any use of gas, or sale of gas, by the town for purposes other than those now customary can only be made with the agreement of the A.-G. für Kohleverwertung.

In addition to these impossible terms, improvement would be required in several others, dealing with gas quality, road rights, the failure of supplies due to strikes, and other matters.

The Reply of the Gas Industry.

The gas industry's reply may be summarized under four heads.

1. The large cities, in their own gas-works, are producing gas as cheaply as, and in some cases even more cheaply than, it is offered by the coke ovens. A few of the smaller places would, no doubt, benefit as regards price.

2. Security of supply, which is of paramount importance, would not be so great as at present.

3. As regards bye-products, the towns would be entirely the losers, and especially for their coke requirements would they have to pay higher prices.

4. The scheme would leave practically a fuel monopoly in the hands of the Ruhr coal interests.

The Effect on German Industry.

As regards the general industrial effect, several points cannot be overlooked. The closing of gas-works would throw out of employment some 18,000 men, and experience in other instances has shown that it would be extremely difficult to absorb them in other industries. Firms which have always supplied gas-works with carbonizing and other plant, refractory materials, and apparatus would suffer; and, they being unable to exist on exports alone, these would probably also be lost to the country. The State Railways would lose an estimated sum of 40 million marks at present received for coal freightage, against which they might receive an additional 15 million marks for transport of coke. Taking these and other considerations into account, it would be difficult to justify a capital outlay on the new scheme of 400 million marks [20 millions sterling], especially in view of the big expenditure in recent years on existing works which would now be shut down.

The future of the gas industry, in the author's opinion, will undoubtedly lie in unification of one kind or another. From every point of view, the realization of this principle by the grouping of supply districts around big and highly efficient gas-works appears much more promising than the scheme proposed by the coal interests.

COAL AND BYE-PRODUCT EXPORTS.

The Board of Trade returns for June are of exceptional interest, seeing that they complete the first half-year's trading since the great coal stoppage. They show that, in comparison with the first half of 1925, the coal industry has done well in recovering its markets abroad, though at a sacrifice.

Coal Exports.

In June, the amount of coal exported was 4,312,954 tons, compared with 34,485 tons in June, 1926, and 3,733,845 tons in June, 1925. The values were: June, 1927, £3,848,706; 1926, £37,818; 1925, £3,768,521. Of these totals, gas coal in June represented 546,756 tons, as against 484,804 tons in June, 1925. No gas coal was exported in June, 1926. The value of the gas coal shipped in June this year was £448,188 (averaging 16s. 4·7d. per ton); and in June, 1925, the value was £455,494.

Taking the complete six months, the quantity of coal exported was 26,318,921 tons, as compared with 18,964,089 tons in the first half of 1926, and 25,848,443 tons in the first half of 1925. The values were: 1927, £24,798,383; 1926, £17,229,206; 1925, £26,912,336. It will thus be seen that, though we exported more coal last half year than in the corresponding period of 1925, the receipts were over £2,000,000 less. Of these figures, gas coal represented in the half year 3,426,762 tons; in the first half of 1926, 2,491,787 tons; and in that of 1925, 3,422,795 tons. The values of these quantities of gas coal were: 1927, £2,950,138; 1926, £2,032,988; 1925, £3,389,518.

Exports of Coke.

In June, the quantity of gas coke exported was 49,311 tons; in June, 1926, 2091 tons; and in June, 1925, 15,840 tons. The values of these quantities were: 1927, £48,909; 1926, £2213; 1925, £14,529. The average value for June was 19s. 10d. per ton. In the six months, the total shipments of gas coke were 328,585 tons; in the same period of 1926, 369,318 tons; and in that of 1925, 224,814 tons. The values were: 1927, £367,773; 1926, £381,033; 1925, £318,466.

Regarding metallurgical coke, there are signs of an improvement, but in the half year business has been of a low order. In June, the quantity of oven coke exported was 55,112 tons; in the same month of 1926, 847 tons; and in that of 1925, 76,246 tons. The values were: 1927, £65,978; 1926, £1514; 1925, £86,721. In the six months, the quantity of metallurgical coke sent abroad was 232,972 tons; in the corresponding period of 1926, 374,082 tons; and in that of 1925, 582,212 tons. The values were: 1927, £326,288; 1926, £427,064; 1925, £751,846.

Tar Products.

It is almost useless to refer to the business abroad in benzole and toluole, as exports in these have declined to insignificant figures, and the same applies to naphtha. However, for the half year only 27,929 gallons of benzole and toluole were shipped, as compared with 418,535 gallons in the first half of 1926. As to naphtha, 18,262 gallons were exported in the half year, compared with 53,177 gallons in the same period of 1926. Regarding tar, oil, creosote, &c., the exports in June were 3,376,367 gallons, as compared with 6,902,246 gallons in June, 1926. In the half year, the total was 21,615,194 gallons, as against 26,875,943 gallons in the June half of 1926.

Sulphate of Ammonia.

At length the business in sulphate of ammonia has looked-up—that is, compared with the June half of last year. Taking first the figures for June, 33,742 tons were exported, as against 12,270 tons in June, 1926. In the past half year, 113,404 tons were shipped, compared with 103,083 tons in the first half of 1926. Our best purchasers were Spain and the Canaries with 43,852 tons in the half year, compared with 24,064 tons in the corresponding period of 1926. Japan came next with 34,289 tons, as against 27,973 tons in the June half of 1926. The Dutch East Indies show a considerable falling-off. Their purchases last half year only amounted to 2673 tons, as compared with 17,214 tons in the same period of 1926. In the half year, France has not been a buyer—from us at any rate.

Gas Oil Imports.

During the half year, there has been a large influx of gas oil to this country. In June, the amount was 9,993,818 gallons, compared with 8,438,917 gallons in June, 1926. For the half year, we received 58,966,259 gallons, as against 35,151,386 gallons in the first half of 1926.

COLLIERY SUBSIDENCES AND GAS-WORKS.

The final report has been issued of the Royal Commission on Mining Subsidences, which has been sitting under the Chairmanship of Lord Blanesburgh. The question of the operation of the law relating to the support of the surfaces of land, and of buildings and works on or under the surface, by underlying or adjacent material, is an ancient one. Looking through the report and noting the numerous interests involved, the extensive character of the area of investigation, and the baffling intricacies of the subject in its different aspects, we are not surprised that in the result the Commission does not appear to have discovered any very remarkable steps which could be taken by legislation or otherwise to remedy, equitably to all persons concerned, any defects or hardships that may be found to arise under existing conditions.

It will be remembered that, on behalf of the National Gas Council, Mr. T. P. Ridley, of Newcastle-upon-Tyne, gave evidence before the Commissioners. Though he presented a clear case, and illustrated well the damage occasioned by the subsidence of the property of gas undertakings, we find that the Commissioners are not prepared to make any recommendation regarding compensation in circumstances and on grounds which will be explained. In their summary of the position and recommendations, they refer to cases where minerals have been granted or reserved without liability on the part of the mineral owner to make to the surface owner, in respect of subsidence damage due to their working, even compensation in money. It is mainly owing to provisions of this kind that many owners of buildings damaged by subsidence are without remedy. The property so affected is roughly divided into two classes: (1) That of local authorities and public utility companies in respect of sewers, water, gas, or electricity mains, tramway lines, and the like; and (2) houses and other buildings. While the Commissioners are not prepared to make any recommendations as to compensation, they are of opinion that the right given to other persons under Part 1 of the Mines (Working Facilities and Support) Act, 1923, to prohibit and restrict the working of minerals should be extended to local authorities and statutory undertakings to which the mining code applies.

The Legal Position.

The report is full of interest. Among many other matters, it discusses the legal position. There is reminder of the fact that the law of England and Scotland recognizes and protects a property in unsevered minerals as completely as the property it recognizes and protects in land itself. It reserves to the owner of these minerals the fullest power to convert them as a whole into a separate hereditament, or, as strata, into separate hereditaments. In these separate hereditaments the law recognizes a title as undoubted as that in the surface or in the entirety of the land. A second and separate principle of law, equally undoubted, is that where the surface and subjacent and adjacent strata are in separate ownerships, the surface in its natural state is entitled to support from such strata. But it is only the surface in its natural state which is entitled at common law to this absolute support. Where the surface is burdened by buildings, the presumption, at least in England, is that these, as such, have no right of support. But the qualification is in most cases theoretical only. For the physical laws of subsidence being what they are, it is not as a rule difficult to show that the surface which with buildings on it has subsided would equally have subsided in its natural state. Moreover, in England, after twenty years, an absolute right of support for buildings also is acquired by prescription.

No surface owner has ever been required by the Courts to accept compensation in lieu of support. His right of support is absolute even to the extent of having his land maintained at its original level, though at the lower level it would suffer neither in value nor utility. Thus the important thing about the legal aspect is that it is only the surface of the land, and not the buildings placed upon the land, which has a right to support. But the position, so far at all events as it concerns cases in which the surface retains the right to absolute support, has been profoundly modified by the Mines (Working Facilities and Support) Act, 1923. By that Act the Legislature has declared that the danger of minerals being left permanently unworked has become a matter of national concern; and provision is made for enabling minerals to be worked irrespective, speaking generally, of the resulting effect upon specific surface property, and notwithstanding that, apart from the Act, the surface is entitled absolutely to support. To the extent to which such property is thereby injured, the owner is, again generally speaking, to be entitled to, but he must be content with, pecuniary compensation. The right to work minerals in such cases is embodied in an order of the Railway and Canal Commission, which confers, where necessary, in express terms, a right to let down the surface and fix the terms of compensation to be paid for surface damage. It is true that the Commission, in determining whether the right to let down the surface is to be granted, is to have regard to the value of the minerals required for the support of the surface, or of existing or intended works or buildings, as compared with the value of the surface, works, or buildings themselves, and is to consider whether the support of the surface, works, or buildings is, in the national interest, more important than the working of the minerals.

Public Utility Undertakings.

Coming to the properties of local authorities, public utility companies, and statutory gas and electricity concerns, the Commission deals with the present position of the different undertakers entitled to the benefits, and subjected to the burdens, of the provisions of what is known as the mining code. The mere execution of a work in pursuance of their statutory powers gives to undertakers under the code no right of support at the outset. Consequently, whatever the mine owner's wishes may be, the undertakers are bound neither to purchase the underlying minerals nor to pay him compensation for leaving them unworked. But the code gives the undertakers the right, on complying with certain statutory requirements as to the deposit of plans of their undertaking, to receive notice when the mineral workings have advanced to within a prescribed distance. Where no distance is prescribed in the Special Act, the limit is forty yards. On receipt of this notice, undertakers have the option of requiring the minerals up to that distance, or, in the case of sewers or other sanitary works of a local authority, both beyond and within it, to be left unworked on payment of compensation to the mine owner. If they do not exercise this option, the mine owner is free to work on, and the undertakers have no claim to compensation for any damage caused by subsidence from working within the prescribed distance unless the working was "improper" or "unusual." If they do exercise the option, they must pay not only compensation based on the loss of profits on the mineral sterilized, but also any additional cost to which the person working the minerals may be put by reason of the continuous working of the mine being interrupted.

It was suggested to the Commission that the provisions of the code were reasonable enough in 1845, but that they have ceased to be reasonable now that deep mining, with surface consequences then unforeseen, has, to an extent never contemplated in 1845, become the rule. The Commission recognizes that the advent of deep mining has enormously increased the extent, both vertically and laterally, of coal which it would be necessary to purchase in order to secure effective support; and the resultant cost, even in the case of principal works, and *a fortiori* in the case of such properties as mains or sewers, would normally be quite prohibitive. Furthermore, if such purchases could be financed to the extent necessary for support, the result would be to sterilize, for a purpose entirely inadequate, a vast amount of coal, contrary to the whole principle of the Mines (Working Facilities and Support) Act, 1923.

Giving of Notice.

In so far as the code gives undertakers the right to defer any question of compensating the mine owner till, in the opinion of the undertakers, their works are actually threatened, its provisions are most valuable, and materially reduce the amount of compensation payable by, for example, a local authority in a mining area. Further, the right to receive notice when mineral workings are at a prescribed distance is useful in many cases, as it gives the undertakers an opportunity of carrying out frequent inspections of the threatened works and executing timely repairs. With regard to the right conferred by the code to require minerals to be left unworked on payment of compensation, this protection—now probably out of harmony with present legislative policy—is mainly illusory, if only for the reason that, in these days of deep mining, few undertakers, if any, can afford to pay the amount of compensation necessary to ensure specific support. In the case of undertakings governed by the code, the general principle is that, so far as the code is applicable, the undertakers have no common law or other right to support or compensation. Prior to the House of Lords decisions in the New Moss Colliery case in 1908, and the Howley Park case in 1913, it was assumed that the code completely ousted the common law; but in these cases it was definitely laid down that outside the forty yards limit the common law rule held good. It resulted that water undertakers, railway companies, and others found themselves entitled to lateral support beyond the statutory distance without having paid for it, and were thus in many cases enabled to restrain the working of minerals by injunction long before the workings reached the zone (normally a distance of forty yards or less from the works) within which the mine owners were entitled to compensation for leaving the coal unworked.

In regard to statutory water undertakings and certain works of local authorities, the Commission says that the anomalous position in part created, or at least declared to exist, by the New Moss Colliery and Howley Park judgments still remains; and they feel strongly that the stage has now been reached when an effort should be made to see whether an agreement cannot be reached for the introduction of legislation to amend the mining code in its application to undertakings other than railways. But the claim of the local authorities and statutory companies as presented to the Commission went much further

than this. Their claim was that notwithstanding the terms of the code they should, without further payment of any kind, be entitled to full compensation for all subsidence damage sustained by their property. Everything that could be said in support of this claim was put forward in an able memorandum presented by Mr. W. E. Whyte, Clerk to the District Committee of the Middle Ward of the County of Lanark. Formidable, however, as was the case thereby made, Mr. Whyte agreed in the end that the whole trouble was one of money. It being conceded that the right to support had in the cases stated never, by purchase or otherwise, been acquired by the local authorities, and that nothing had been paid in respect of it, the question was whether the damage due to the withdrawal of that support was to be borne by the authorities themselves or be made good for their benefit by others—in point of fact by the coal workers or owners. The Committee, having carefully considered the points, reached the conclusion that the damage in question should continue to be borne by the authorities.

STATE RELIEF.

Another submission to the Commission was that the State might properly be asked to provide relief for local authorities on the ground that damage to their properties incurred as a result of what may be fairly described as a national service—the utilization of the mineral resources of the country—should not be left to be borne by them alone, but by the community as a whole. If the relief which these authorities claim, or could be awarded, had been actual support for their sewers, &c., this view might be more compelling. But their claim is one for pecuniary compensation only. Upon this, the Commission says the evidence is copious and uniform that, after the cost of making good all damage has been met, and the additional expense incurred by reason of the presence of the collieries in their midst has been defrayed, the local authorities concerned, through receipt of rates, are, on balance, better off pecuniarily than they would have been had the subjacent minerals not been worked at all. The result, therefore, it may with some confidence be stated, is that, while the areas affected participate with all other areas in due order in the national benefit from coal working, their own special portion in a pecuniary sense is one not of loss, but of gain. The claims of the public utility companies are in the judgment of the Commission no stronger than those of the local authorities. They fall to be rejected as the result of analogous reasoning.

In relation to this question generally there is, however, one respect in which, as it appears to the Commission, the position of the local authorities and certain statutory undertakings may properly be strengthened. There seems no reason why the privilege given to other persons to acquire, on the grounds of the national interest under Part 1 of the Mines (Working Facilities and Support) Act, 1923, the right to prohibit or restrict the working of minerals should not be extended to the local authorities and statutory undertakings to which the mining code applies.

A little later on, dealing further with the arguments put forward by statutory undertakings, the report points out that the undertakings pay nothing for the support for the withdrawal of which, with its consequential damage, they seek to be compensated. When they have established themselves in an area liable to subsidence, they have done it so that they might profit by the commerce of the area or by its proximity to a coal supply and plentiful labour market. In either case, they have gone there voluntarily, and must be presumed to have taken with their eyes open the risk of subsidence. It was hardly suggested on their behalf that their position in this respect had not always been fully appreciated. In the judgment of the Commission no case at all was made for alteration in the status of any of these undertakings. The conclusions with regard to statutory gas companies are the same, and it is thought that similar considerations are applicable to them.

Case-Hardening with Town Gas.—The idea of case-hardening with town gas rich in carbon is not new, but has never been carried out on anything like a commercial scale. The research laboratory of the Rombacher Hüttenwerke at Bochum has lately taken up the subject, and tried the process on two carbon steels, one containing 0·06 p.ct. of C and 0·39 p.ct. of Mn, and the other 0·12 p.ct. of C, 0·12 p.ct. of Si, and 0·69 p.ct. of Mn, and also on a special steel containing 0·18 p.ct. of C, 0·15 p.ct. of Si, 0·36 p.ct. of Mn, 1·85 p.ct. of Ni, and 0·44 p.ct. of Cr. The steels were case-hardened with town gas under various conditions of temperature and lengths of exposure. The depth of the case, the variations in texture, resistance, hardness, &c., were duly investigated. The experiments showed that in case-hardening with town gas under the most favourable conditions a case of 4 mm. could be obtained without any free cementite. The carbon content in this zone was not constant. As was to be expected, it gradually decreased towards the interior, but even at a depth of 4 mm. the steel was as hard as glass. Subsequently, however, the carbon steels required a double heat-treatment to reduce the size of the grain, while in the case of the chrome-nickel steel the growth of the grain was not so pronounced, and a single heat-treatment sufficed to reduce its size.—"Iron and Coal Trades Review" for July 8.

RETENTION OF HYDROCARBONS BY SOLID FUELS.

In the July issue of "Fuel in Science and Practice" Moore and Sinnatt discuss experiments in which fuels were exposed to the vapours of benzene, toluene, and xylene. The fuels used were bituminous coal, anthracite, Irish peat, gas coke, animal charcoal, and wood charcoal, in powdered samples passing a 200-mesh I.M.M. sieve; 3-gramme samples being employed. The specimens were contained in shallow glass dishes, and were heated for 1 hour in an oven at 105° C., cooled over sulphuric acid, and weighed. In the case of the samples to be exposed to the vapours, the shallow dish containing the liquid hydrocarbon was placed in a desiccator so as to rest on a glass frame directly above the dish containing the sample of fuel.

When a sample of powdered fuel is exposed to the vapour of a substance which it is capable of absorbing, the measurable result may be regarded as the resultant effect of several simultaneously progressing influences, the chief of which are (1) the evolution or displacement of moisture and occluded gases, and (2) the absorption of the vapour by the fuel. The latter may take place by two main processes—(1) physical, involving condensation of the vapour in the capillaries of the absorbent, and determined largely by the physical properties (vapour pressure, surface tension, density, and molecular weight) of the liquid resulting from the condensation of the vapour; and (2) chemical, determined by molecular orientation, primary and secondary valencies, and polar relationships.

Curves indicate that in the case of peat samples either the displacement of moisture and occluded gases has been so great as to mask the absorption of the vapour (and by such a process the absorption of the vapour would appear thus to have exercised a drying action on the peat) or the selective absorptive factor of peat for the hydrocarbons is very small.

In the case of the other fuels, the absorption of the vapour by the fuel appears to have been the predominating influence; and in these instances the increase in weight of the fuel samples may be assumed to represent approximately the amount of vapour absorbed.

The fact that the capacities of the charcoal samples for absorbing the hydrocarbons were so much greater than that of coke is evidence that differences in the physical properties of the particles may have considerable influence upon the absorption.

The loss in weight of the fuel samples after removal of the liquid hydrocarbon, but before exposing the sample to the air of the laboratory, was in most instances rapid for the first forty hours, but decreased gradually up to 480 hours, after which the loss was very slow. The following figures indicate approximately the proportion of the absorbed vapour which was subsequently lost.

Vapour Absorbed: Benzene.

Fuel.	Grammes per 100 Grammes of Fuel.		Ratio (2) ÷ (1).
	(1) Increase in Weight after 15 Hours.	(2) Loss in Weight after 480 Hours.	
Charcoal No. 1	16·6	16·4	0·98
Bituminous coal	18·4	16·4	0·88
Anthracite	15·3	11·9	0·77
Gas coke	0·9	0·57	0·63

The increase in weight and variation in weight after exposure to air were approximately the same for the samples which had been exposed to the vapour and for the samples which had not been exposed to the vapour, indicating that previous absorption and retention of the vapour had a negligible influence on the capacity of the fuel samples for absorbing moisture.

The Thousand-and-Second Use of Gas.—It may not be generally realized that the famous Junkers aeroplane is the product of the same brain as the Junkers calorimeter. What is still more interesting is that Dr. Junkers, the head of the firm, looks upon the all-metal aeroplane almost as the child of the gas industry. Describing at the recent German Gas Association meeting his thirty-years' connection with the industry, he stated that it began with attempts to effect improvements in the gas engine. "From experiments with the gas engine," he said, "came the calorimeter. From the calorimeter came the bath-heater; and finally, during the war, when all production of gas apparatus was stopped, there came from the bath-heater the all-metal plane. I believe I can justly claim that, had it not been for the first systematic experiments with a metal wing, undertaken with all the experience at the disposal of the staff and men of Junkers & Co., we should not to-day have had the all-metal aeroplane. This, in its turn, has produced the Junkers air service, which extends to all corners of the earth."

ADVANTAGES AND DISADVANTAGES OF DRY QUENCHING OF COKE.

The Sulzer Plant.

By A. M. BEEBEE, Superintendent, Gas Manufacturing Department, Rochester Gas and Electric Corporation, N.Y.

[Abstract of a Paper read before the Canadian Gas Association, Toronto.]

Our Company, after studying the subject of dry quenching, purchased a plant of the Sulzer type, designed by Sulzer Frères, of Winterthur, Switzerland, and erected by the J. G. White Engineering Corporation of New York City. It is the first plant in this country. In outlining the advantages and disadvantages of the dry cooling of coke, I shall, of course, be obliged to confine myself to a dry quencher of the Sulzer type.

Our dry quencher is made up of two identical units with their boilers, of 212·5 tons rated capacity, placed side by side, making a total of 425 tons of cooled coke daily capacity. These two units are charged by a single skip hoist between them. Provision has been made so that a third unit can later be installed to feed from this single skip hoist and to discharge on to the wharf in a manner similar to the existing two units.

There are some points in our design which I think could be improved. The handling of the coke is unusually severe, and considerable breakage results. This, to us, is not an objection, as we have to crush all our coke over 2¾ in., for we supply a domestic market. The dry quencher, as we have it, acts as a fine coke crusher, and saves us the power and expense of maintaining a crusher.

The economies of the outfit for any local condition can be calculated from the following data, depending on the various factors entering into the cost. The total investment in our case was slightly under a quarter-of-a-million dollars, and the operation can easily be handled by one man.

INTANGIBLE BENEFITS FROM DRY QUENCHING.

Elimination of steam and vapours of wet quenching.

Elimination of wet quenching vapours certainly should reduce corrosion, maintenance, and painting expense of all adjacent steelwork.

Dry quenching should aid considerably in reducing the maintenance cost and prolonging the life of the hot coke car equipment.

Elimination of wet quenching should allow of better retort house conditions.

Better efficiency is attained in apparatus using the resultant coke, such as water gas plant and producers.

There is one other intangible benefit from dry quenched coke which is mentioned here merely as an interesting point for consideration. When coke is wet quenched, water vapour is drawn into the heart of the coke. Dry quenched coke, even with a similar moisture content, may therefore have a beneficial effect on fuel beds in water gas plants and producers, for the following reason. In the case of the dry quenched coke, surface moisture is quickly driven off, and only reduces the temperature of the exit gases from the fuel bed, and as such has little or no effect on fuel bed temperatures. With wet quenched coke, the moisture in the heart of the piece is evolved countercurrent to the heat flow into the piece of coke. This might result in the moisture not being given off till the coke is well down in the fuel bed, which might have a considerable effect on fuel bed temperatures. This theory has some substantiation, in that it is generally known in the gas industry that continuous vertical coke will give results in water gas plant or producers which other coke cannot equal. In the past this has been attributed to the structure of the coke.

ACTUAL OPERATING RESULTS.

Since starting, our average operating results have been as follows:

Average power consumed per day, fans	858·2 KW.H.
,, ,, ,, ,, hoist	82·8 ,,
,, temperature of feed water	119·3° Fahr.
,, steam pressure	139·2 lbs. per sq. in.
,, coke charged per day, 1000 lbs.	728·4
,, temp. of hot coke inlet to quencher	1275° Fahr.
,, ash content of coke	10·5 p.ct.
,, breeze content	5·5 ,,
Actual steam production under above conditions per 1000 lbs. of coke cooled, determined by water meter	402·6 lbs.

During two months since we have had more uniform operation, our steam per 1000 lbs. of coke has averaged 420 lbs.

It seems that dry quenched coke is not stronger, but that its apparent strength is due only to the fact that it has been more severely handled, and the stronger pieces have survived.

A DISADVANTAGE.

Extreme care in the design of the equipment is necessary. Some points could be improved upon in future design. The points which have given trouble, however, have been largely in the nature of auxiliaries, and not fundamentals of the quencher. That part of the equipment which has to do with the cooling of coke, which was designed by Sulzer Frères, has been remarkably free from defects. We recently had both containers down for inspection after seven months of operation, and the inside of the containers, fans, and boilers was in excellent condition.

If large coke size is desired, the dry quencher has a very serious disadvantage.

If the coke is to be used for domestic market, the absolutely dry coke from a dry quencher is apt to be a source of complaint, due to dustiness. The producers of continuous vertical coke are already familiar with this detail. For such a market we have found it necessary to sprinkle the coke as it drops into the domestic storage bins prior to loading the trucks. This method gives us dry fuel for our producers and water gas plants.

THE RELATIONSHIP BETWEEN TAR CONSISTENCY AND TEMPERATURE.

There appeared under this title, in "Brennstoff-Chemie" for June 1, an article by H. Mallison and F. Soltau. As it contains a criticism of a paper by H. M. Spiers, of the Research Section of the Woodall-Duckham Companies, which he read at the Manchester Tar Conference last November, and which appeared in the Journal of the Society of Chemical Industry, we consider many of our readers will be interested in a translation of the German article.

VARIATION OF THE HUTCHINSON CONSISTENCY OF TARS WITH TEMPERATURE.

By H. M. SPIERS, M.A., B.Sc., F.I.C.

[ABSTRACT.]

The author points out that the measurement of the consistency of a tar by the Hutchinson tester, which operation is carried out at 77° Fahr., is a lengthy one. This disadvantage would be obviated if the test could be carried out at a somewhat higher temperature; and if a mathematical relationship between consistency and temperature can be established, the consistency figures obtained at temperatures differing from 77° Fahr. can be corrected to the standard temperature.

Consistency, states Mr. Spiers, can be expressed in terms of temperature in accordance with the differential equation

$$dC/dT = - kC$$

Integration of the equation yields the relationship

$$\log C - \log C_T = K(T - 77)$$

$$\text{or } \log C_T = \log C + K(77 - T)$$

where C is the consistency of the tar at the standard temperature (77° Fahr.) and C_T is the consistency of the tar at a temperature of T° Fahr. K is a constant depending on the tar.

The value of K may be deduced by observations of the consistencies C_1 and C_2 at two known temperatures T_1 and T_2 since

$$\log C_2 - \log C_1 = K(T_1 - T_2)$$

Also, when consistency and temperature are plotted on semi-logarithmic paper, the straight line obtained by joining the two points corresponding to the observations made at the two temperatures enables the consistency at any temperature to be read directly without calculation. Greater precision is obtained by making a number of observations at different temperatures, and drawing the straight line in such a position that it represents the observations in the best possible way.

THE VALUE OF K.

The extreme figures so far encountered for the value of K are 0·0334 and 0·0502, indicating respectively that intervals of temperature of 9° and 6° Fahr. will cause the consistencies of the tars in question to be doubled or halved according as the temperature is lowered or raised through the temperature interval mentioned.

It would appear, from the data at present available, that the value of K is, in the case of horizontal-retort tars and of vertical-retort tars, influenced mainly by the naphthalene content of the tar, and that specific gravity and free carbon content play no important part.

A table (reproduced in part in the criticism which follows) is given, relating to a horizontal tar of fairly high naphthalene

content; and the author affirms that this illustrates the accuracy with which calculations governing consistency and temperature may be made, and is typical of the results on which the relationship has been based.

In the case under consideration the value of the constant is 0·03883, and the consistency of the tar at 77° Fahr. is 14·5 seconds. The formula then becomes

$$\log C_T = \log 14{\cdot}5 + 0{\cdot}03883\ (77 - T).$$

Mr. Spiers constructed a nomogram with a view to enabling the consistency value at 77° Fahr. to be deduced as a result of the determination of the consistency of a tar at two known temperatures. He states that, once these determinations have been made in the case of a particular tar, the consistency of the tar at other temperatures within a convenient range can be ascertained by means of the nomogram.

The value of the nomogram is that it enables a process chemist to correct faulty batches of tar or to make adjustments to a tar still far more quickly than is possible if the tar to be tested has to be brought exactly to 77° Fahr. With very thick tars there is always a doubt as to whether the whole body of the tar is at the standard temperature. This arises partly from the viscosity of the tar which renders stirring difficult, and partly from the low heat conductivity of tar. Another point to be taken into consideration is the fact that the energy required for the stirring becomes transformed into heat, causing local overheating, and that this heat is not readily dissipated by conduction.

In the case of thick tars the uncertainty as to the temperature may amount to at least 1° Fahr.; and the effect of this on the consistency is shown by the consistency-temperature equation to be very considerable. Thus, in the case of a 100 seconds and a 10 seconds tar, the errors due to a variation of 1° Fahr. from the standard temperature will amount to about 10 seconds and 1 second respectively—in each case an error of about 10 p.ct. With tars of (say) 10 to 30 seconds consistency, a uniform temperature throughout the mass is obtained and measured with comparative ease, and the uncertainty need not amount to more than 0·2° Fahr. It would, therefore, appear to be more accurate to determine the consistency of a 100 seconds tar at temperatures at which its consistency is from 10 to 30 seconds, and to deduce the consistency at the standard temperature by means of the nomogram.

With tars for which the value of K is low, the optimum conditions for accuracy cannot in the case of thick tars be obtained unless the observations are made at temperatures in the neighbourhood of 100° Fahr.; but an improvement as regards accuracy over the result obtained by direct determination at 77° Fahr. will nevertheless be realized by making the two determinations at two known temperatures—say, 84° and 91° Fahr.—and establishing the consistency value for 77° Fahr. by means of the nomogram.

In the case of very thin tars, having a consistency less than 5 seconds, the personal error in timing, even with a good stop-watch, begins to assume distinct dimensions, and with such tars it would be an advantage to make observations at temperatures below 77° Fahr., ascertaining the consistency value at the standard temperatures by help of the nomogram.

THE CRITICISM—BY H. MALLISON AND F. SOLTAU.

The Hutchinson consistency test has received general adoption in Germany, as well as the Ministry of Transport standard specifications for road tar. As is well known, the Hutchinson test requires the use of about 1½ litres of tar, and it has to be made with the tar at a temperature of 77° Fahr., or 25° C. The difficulty of bringing the tar—a liquid of low heat conductivity—to a uniform temperature of 77° throughout its mass, whatever the atmospheric conditions, is a serious one. There would, of course, be a considerable saving of time if the test could be carried out at some higher temperature, at which the consistency would be lower; but, as Spiers pointed out, corrections to the standard temperature could only be made if a knowledge of the mathematical relationship between consistency and temperature could be established.

The authors refer to several attempts which have been made in the past in the lubricating oil industry to establish such a relationship, but even there their accuracy and utility have always been disputed. Still less has anything of the sort been achieved with coal tar, so different and so complicated in chemical composition, until the work of Spiers at present under discussion.

It is well known that the consistency curve of a given substance falls with increasing temperatures, rapidly at first, and then more slowly. The consistency, which at the point of solidification is infinitely great, is almost down to zero at boiling point, and between these two extremes the curve is hyperbolic, descending at first almost perpendicularly, and then becoming flatter by degrees. The greater the consistency at any given temperature, the greater is the gradient of the curve at this point. The more rapidly the consistency falls at higher temperatures, the flatter will be the nature of the curve. Spiers, in the same way as did the German investigators, endeavours to establish a relationship between the direction and the height of the curve. In doing so, he chooses the simplest imaginable form, and assumes proportionality between consistency and the fall of the curve. If, for example, at a temperature of 15° C., the consistency measures 40 seconds, and, according to the gradient of the curve at this point, the consistency drops by 5 seconds for every 1° increase in temperature, then, at the temperature at which the consistency measures 20 seconds, the drop in consistency per degree of temperature would be only half as much—*i.e.*, 2½ seconds, and only one-fifth, or 1 second, when the consistency was 8 seconds. Mathematically stated, this implies that the differential quotients of the consistency curve are to one another as the consistencies themselves. Taking the temperature as T, and the consistency as V, then for points 1 and 2 the relationship would be—

$$(1)\quad \frac{dV_1}{dT_1} : \frac{dV_2}{dT_2} :: V_1 : V_2$$

and this can be so expressed that the consistency represents a constant multiple K of the equivalent differential quotients of the curve

$$(2)\quad \frac{dV}{dT} = KV$$

Integration of this equation yields the relationship—

$$(3)\quad \log V = KT + c$$

in which c is the integration constant. Or, for two different points,

$$(4)\quad \log V_1 - \log V_2 = K(T_1 - T_2)$$

As consistency decreases with increasing temperatures, K in this equation must become negative, but when K is positive, the equation may be put in the form—

$$(5)\quad \log V_1 - \log V_2 = \log \left(\frac{V_1}{V_2}\right) = K\ T_2 - T_1)$$

Assuming that this equation really does correspond in practice with the curve, then it would only be necessary to know the viscosities at any two given temperatures in order to be able to estimate the value of the constant K, or, in other words, to estimate the consistency at any required temperature.

Spiers found, from experiments with a large number of tars, that the factor K varies between 0·0334 and 0·0502, according to the composition of the tar. This is, of course, based on the Fahrenheit scale, and the values multiplied by 9/5 would be the equivalents for Centigrade.

As an example, Spiers gave a set of observations upon a horizontal retort tar of fairly high naphthalene content, comparing actual with estimated values.

Temp. ° Fahr.	Observed Consistency. Seconds.	Estimated (K = 0·03883).
73·0	21·0	21·0
75·0	17·5	17·6
77·0	14·5	14·7
80·0	11·0	11·2
83·2	8·5	8·4
86·8	6·0	6·1
91·0	4·2	4·2
96·5	2·8	2·6

From the good agreement shown by these results, say the authors, Spiers assumes that his suggested formula is sufficient for determining standard consistency by means of tests at any two convenient temperatures, and they refer to the graphical method by which he proposes its application. Their investigations showed, however, that the method does not lead with reliability to the desired results. If equation (5), they say, is really applicable to all cases, then every combination of the consistencies at two different temperatures must lead to one and the same value at 77° Fahr., within the limits of experimental and other minor errors. Taking the seven readings from the above table (that at 77° being omitted, as it is the one required to be found) 21 combinations can be formed, which give 21 different readings for the consistency at the standard temperature. They are as follows:

Lower Observation. Temp. ° Fahr.	Higher Observation Temperature.					
	75.	80.	83·2.	86·8.	91.	96·5.
73·0	14·58	14·51	14·73	14·61	14·69	14·90
75·0	..	14·53	14·68	14·60	14·65	14·76
80·0	..	..	14·00	14·37	14·30	14·10
83·2	..	..	..	15·47	14·90	14·25
86·8	..	..	..	..	13·80	12·95
91·0	..	..	..	..	..	11·78

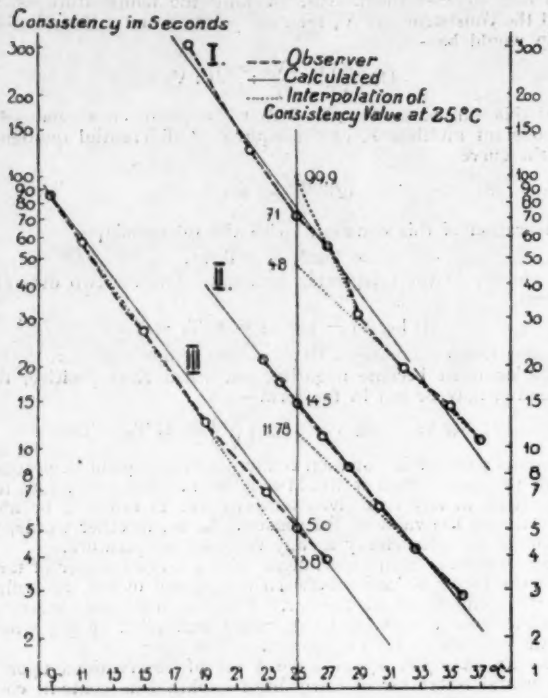
The experimental value at 77° was 14·5. If, therefore, it is assumed that all values between 14 and 15 are good enough, then 17 of the 21 combinations give a satisfactory result, and four do not. In general it might be said that Spiers' formula is vindicated by these results. On the other hand, it might be suggested that the values obtained appear reliable only when the observation temperatures are somewhere near the standard temperature of 77°, or at any rate are one on each side of it.

The authors then set themselves to investigate whether equally good results were obtainable with other tar samples.

In answering this question, it is as well to be clear first of all exactly what is the meaning of such logarithmic equations as, for example, Ohlschläger has stated, and what limitations they impose upon the course of the curve. Putting log V = Z in equation (3), the relationship between Z and the temperature is represented by the equation—

$$Z = KT + c$$

This is the equation of a straight line. Therefore, if instead of plotting the consistency value itself in the graph the logarithm of the value be used, it must give a straight line, or at least be able to be approximately represented by a straight line. A graph plotted in this way (curve II. in the diagram) does actually show that the eight values of Spiers' example give a reasonably straight curve, only the higher observed temperatures (91° and 96·5°) being somewhat off the line. If it could be shown that the same holds good in the case of other tars, Spiers' thesis could be taken as proved. Such, however, did not prove to be the case.



A surface tar was taken, prepared from mixed crude tar from a gas-works, and having the following properties:

Sp.Gr. at 15° C.	1·200
Water or ammonia	..
Other distillates (under 170° C.)	..
Fractions between 170° and 270°	12·2 p.ct.
,, ,, 270° ,, 300°	6·4 ,,
Phenols	2·2 ,,
Naphthalene	3·2 ,,
Free carbon	10·3 ,,

The consistency of this sample was determined experimentally at seven temperatures, and the values found are set out in the following table:

°C.	1	2	3	4	5	6	7
	Consistency by Experiment.	Consistency by Calculation. a K=0·0827	Consistency by Calculation. b K=0·0759	Absolute Variation. a	Absolute Variation. b	Relative Variation. a	Relative Variation. b
	Secs.	Secs.	Secs.	Secs.	Secs.	P.Ct.	P.Ct.
9	87·1	89·3	85·9	+ 2·2	− 1·2	+ 2·5	− 1·4
11	59·2	61·1	60·5	+ 1·9	+ 1·3	+ 3·2	+ 2·2
15	27·2	28·5	30·1	+ 1·3	+ 2·9	+ 4·8	+ 10·7
19	12·4	13·3	15·0	+ 0·9	+ 2·6	+ 7·3	+ 21·0
23	6·8	6·2	7·4	− 0·6	+ 0·6	− 8·8	+ 8·8
25	5·0	4·2	5·2	− 0·8	+ 0·2	− 16·0	+ 4·0
27	3·8	2·9	3·7	− 0·9	− 0·1	− 23·7	− 2·6
Mean variation	..	..	..	1·35	1·63	11·70	9·51

These results, plotted on the logarithmic system, give a consistency curve which is by no means a straight line (curve III. in the diagram). It will be seen that it has a disinct bend, sufficient, for instance, to make a straight join of the 11° and 19° values, cut the 25° ordinates at 3·8 seconds, instead of at the observed consistency of 5·0 seconds for this temperature. On the other hand, a straight line through the 9° and 27° readings will give an almost correct reading for 25°—viz., 5·4 seconds.

In attempting to draw a straight line in such a position as to represent the observations in the best possible way, as suggested by Spiers, there were two possibilities. Either the mean absolute variation in seconds (a in the table) could be reduced to a minimum, or the mean percentage variation (b in the table). In the first case, a better approximation of the curve was obtained in the neighbourhood of the higher consistency values than in the second, while, on the other hand, the percentage variations in the first case become rather great at high temperatures, as minor variations in the absolute low values have relatively large effect. Calculation showed that Spiers had used the first method, whereas the authors are of opinion that the other gives more useful results, and have used it in the graphs. In the table, both series are given, and it is noteworthy that two very different values are obtained for K—viz., 0·0827 and 0·0759. In their opinion, if better agreement than this is not obtained by using seven different readings, it is hardly to be expected that only two will give reliable results.

A second tar tested had the following properties:

Sp.Gr. at 15° C.	1·210
Water or ammonia	..
Other distillates (under 170° C)	..
Fractions between 170° and 270°	11·8 p.ct.
,, ,, 270° ,, 300°	5·8 ,,
Phenols	2·4 ,,
Naphthalene	2·5 ,,
Free carbon	8·9 ,,

The results are again tabulated as before, and are represented graphically by curve I. in the diagram. From this it can be seen that once again they do not give a straight line; neither do they, as in the last example, show even a fairly regular and comparatively slight deviation from the straight. The best possible straight line in the logarithmic system shows a mean deviation of 11·9 p.ct., and individual deviations exceed 20 p.ct. The joining of two points comparatively far away from the standard temperature of 25° would give entirely false intersections. This is illustrated in the diagram; the combination of 32° and 37° giving a reading of 48 seconds at 25° C., and 27° and 29° giving 99·9 seconds, as compared with the observed value of 71.

In the opinion of the authors, these two examples demonstrate sufficiently clearly that Spiers' formula cannot be regarded as applicable in general, and they consider it can only have been by chance that a certain agreement was obtained with the tars which he tested. More they cannot say, as he gave only one example, and for the rest indicated merely the limits of the values obtained for K. They acknowledge, however, that it may have a certain usefulness in that the K value, based upon a considerable number of individual readings, gives an indication of the general nature of the curve, though this would involve a great deal of calculation, and could not do more than confirm the information given by a few simple consistency tests at higher and lower temperatures. In conclusion, they express considerable doubt as to whether it is feasible at all to find one formula which would cover all possible consistency curves of such a wide varying substance as coal tar.

The Illuminating and Fuel Gas Industry in Canada, 1926.

Products and bye-products from manufactured gas plants in Canada during 1926 were valued at $18,264,860—an increase of 2 p.ct. over the corresponding figure for 1925—according to data compiled and published by the Mining, Metallurgical, and Chemical Branch of the Dominion Bureau of Statistics at Ottawa. The output of manufactured gas in this industry totalled 14,067 million c.ft., of which 12,573 millions were sold for $14,417,652, and the remainder was used as fuel in the retorting plants, or was unaccounted-for. In addition, 17,891 million c.ft. of gas were produced in the coke industry by establishments engaged primarily in the production of metallurgical coke, and 1532 million c.ft. of still gas were produced in the process of refining petroleum. Of the 44 producing plants, 11 made straight coal gas only; 9 produced carburetted water gas only; 6 made both coal gas and water gas; 3 made mixed coal gas and water gas; 9 others made Pintsch oil gas; and 6 others made acetylene gas from calcium carbide. There were also 2 companies in Ontario distributing coke oven gas for domestic and industrial purposes.

British and German Coal.

The following statement is issued by Mr. Philip Gee, Director of the Colliery Owners' Publicity Department: Mr. Varley stated in the House of Commons recently that since the middle of March British coal had been under-selling Silesian coal in Berlin by 4s. per ton; the respective prices being 25s. 6d. and 29s. 6d. Detailed information that would either confirm or deny this statement was not available at the time, but careful inquiries prove that the statement is incorrect. While it is true that the Berlin Gas-Works are still taking delivery of certain coals purchased at increased prices during the British coal strike, the current price of Silesian screened coal delivered by water-way into Berlin is 24 Mks. per ton. The corresponding price for South Yorkshire hards delivered into Berlin via Stettin would be 23 Mks., without allowing anything for breakage on the sea voyage, which would represent approximately an additional 1 Mk. per ton. As a matter of fact, there is no material quantity of British steam coal sent to Berlin. This coal goes chiefly to ports such as Hamburg and Stettin for consumption in the coastal areas. Obviously Upper-Silesian coal coming to these ports, unless subsidized, must be more expensive.

REGISTER OF PATENTS.

Carburetting Water Gas.—No. 266,680.

HUMPHREYS & GLASGOW, LTD., of Victoria Street, S.W. 1
(Assignees of H. G. TERZIAN, of Philadelphia).

No. 32,715; Dec. 24, 1926. Convention date: March 1, 1926.

This invention, relating to the manufacture of carburetted water gas, has for its principal object the attainment of a higher efficiency in the carburetting, and a more complete utilization of the available combustibles in the water gas set, reducing the amount of heat carried out of the set by the waste gases.

The invention, generally stated, comprises a carburettor, which may or may not contain checkerbrick, and which consists in a generally cylindrical vessel having a pier arranged therein so as to provide an annular space, and, terminating short of the top thereof, an oil spray arranged to spray oil clear of the top of the pier so as to preserve a hot spot, and air and blast gas inlet provisions at the top of the chamber in proximity to the hot spot. In some cases the pier is hollow, and serves to preheat air blast or steam introduced through it; and in some cases the pier is solid or operatively so.

Gas Ovens.—No. 267,461.

WIATT, J. P., of Sydney.

No. 15,019; June 15, 1926 Convention date, March 9, 1926.

According to this invention a waste gas outlet passage leading downwards from the top of the oven or the surrounding flue space opens into the lower end of an upward flue which is provided at or adjacent to its lower end with an air inlet opening of smaller dimensions than the flue; a deflector or baffle being preferably provided adjacent to the air inlet to direct the incoming hot air up the flue.

When the heating gases rise in the oven they pass through the passage towards the waste gas outlet. A comparatively slow movement of these gases takes place, for the reasons that the gases in the passage, being hot, tend to offer resistance to the escape of the heated gases within the oven, and the up-draught in the flue pipe is partly air drawn through the air inlet from outside the oven; the effect being that the heated gases draw in a minimum of cold air through the usual air inlet holes or openings at the bottom of the oven, resulting in the heated gases remaining for a longer period therein.

Furnace Charging Doors.—No. 272,820.

WOODALL-DUCKHAM (1920), LTD., and WELLINGTON, S. N., both of Victoria Street, S.W. 1.

No. 8497; March 28, 1927.

This invention relates to a device for ensuring a central distribution of material which is being charged into a shaft furnace, gas producer, or the like. Such a furnace is generally fed from a hopper or feed cylinder placed on the throat of the furnace, and conveniently cut off therefrom by a horizontal sliding door.

According to the invention, when this sliding door is withdrawn for the purpose of allowing a charge to fall from the hopper into the furnace, no charging occurs until the door has performed about half its travel across the throat of the furnace, because the door is followed by a device (such as another door or its equivalent) which prevents material falling from the hopper into the furnace. At this point of the movement, however, the following door begins to recede, whereby a gradually increasing space is formed at about the middle line of the furnace.

The arrangement is illustrated and described in detail in the specification.

Separation of Water from Mixtures of Ammonia and Water Vapour.—No. 272,970.

COOPER, C., HENSHAW, D. M., and W. C. HOLMES & CO., LTD., all of Huddersfield.

No. 31,800; Dec. 16, 1925.

This invention is for a process of treating a mixture of water vapour and ammonia which consists in bringing the mixture into intimate contact with a liquid having a selective capacity for water, moving in counter-direction to the mixture and maintained at a temperature adapted to reduce its ammonia-absorbing capacity. It further consists in utilizing the latent heat of condensation of water vapour to reconcentrate the liquid which has been diluted by the absorption of the water vapour.

A variety of materials possessing a selective affinity for water may be employed—such as a solution of potassium carbonate at a temperature of 100° to 90° C. Should any considerable proportion of ammonia be also absorbed, means may be provided for recovering it.

Where the invention is applied to the separation of moisture from mixtures of ammonia, steam, and other gases, such as arise in the treatment of ammonia liquor, solutions of ammonia of high concentration may be obtained with simplified apparatus; and direct treatment of the gases to obtain ammonium salts may ensue. Further, the invention may be applied to the production of sublimed ammonium carbonate from still gases; and the process of producing ammonium salts in the manner specified falls within the scope of the application.

In one application of the invention, the vapours arising from an ammonia still are caused to pass through a rectifying column through which, in the reverse direction to the flow of gas and vapour, a solution of potassium carbonate is caused to travel. The column may comprise a plurality of trays furnished with overflow devices and with means whereby the gases and vapours are caused to come into contact with successive bodies of the solution. The liquid becomes diluted by absorption of water; and a stage will be reached when this liquid should be reconcentrated, and the small portion of ammonia which may have been absorbed should be expelled. This may be conveniently effected by utilizing the heat contained in the vapours and the heat set free by the condensation of the water from the vapours. For this purpose the tower is provided with means whereby the spent liquor is caused to flow over the outside of the hot tower.

The ammonia, more or less freed from water, may then be brought together with an acid or with an acid anhydride, and the mixture introduced into water in order to obtain ammonium salts. Further, if the mixture of ammonia and water vapour treated contains an acid anhydride, such as carbon dioxide, the gases, after treatment in the manner above described to secure the removal of water vapour, may be cooled in order to obtain sublimed ammonium carbonate. Moreover, the invention is equally applicable to the production of liquor ammonia.

Dry Meter.—No. 273,049.

ADAMS, A. E., of Exeter.

No. 10,792; April 24, 1926.

This invention, relating to dry gas meters in which the elimination of the usual **Y** shaped outlet under the valve plate provides for a straight-through passage to the outlet for the purpose of preventing oscillation of gas pressure, consists in a mechanism whereby the slides are alternately reciprocated characterized by the combination of cross-over bell-crank rocker levers pivotally mounted by the ends of their short arms on the top plate of the box, and by their long arms pivotally connected through links to the slides of the valves; the bell-crank arms, which cross one another, having their short arms slotted lengthwise for the engagement therein of the eccentric pin or throw-end of a vertical spindle which carries the tangent arm. The latter is pivotally connected to links coupled to the free ends of the flag arms; and the flag wires are positioned inwardly of the box and away from the corners thereof, and each is constituted by two parts doubly bent or returned on themselves and connected pivotally and centrally to the diaphragms.

Retort Plant.—No. 273,063.

DEMPSTER, R., & SONS, LTD., and TOOGOOD, H. J., of Elland.

No. 12,835; May 19, 1926.

The main object of this invention is to provide improved or simplified valve constructions for controlling the connection between the retorts and standpipe.

The invention consists in the provision, within a gas retort standpipe down which a cooling liquid spray descends, of a valve so mounted and controlled that it is automatically urged into open and closed positions and held to its seat. This is advantageously effected by means of a spring, which automatically comes into operation when the valve is moved by the operation to one side or other of its dead centre, whereupon the spring completes the opening or closing movement of the valve and holds it with a definite force against its seat, thus making a perfect gastight joint in spite of heat and dust, and overcoming any slight expansion of the ironwork. The valve may be spherically faced and mounted upon an arm so as to be capable of universal pivoting movement and of rotation thereon about its axis.

Gas Fires.—No. 273,121.

CROSS, W., & SON, LTD., and KIRBY, J. I., both of West Bromwich.

No. 22,818; Sept. 16, 1926.

This invention relates to gas-fires adapted to be fitted within an ordinary firegrate, and which are provided with a rearwardly-extending part capable of resting upon the grate bottom. The invention consists essentially in forming the rearwardly-extending part, which is adapted to rest upon the bottom of the grate, as an integral part of the burner tube, or in directly attaching it to the latter; the rearwardly-extending part being adapted to be attached to the bars of the grate bottom by bolts or other means. The burner tube itself may serve to secure the sides of the frame of the gas-fire together; while in order to support the front of the fire, the sides may carry between them a bar or member fitted with a vertically-adjustable part adapted to rest upon the hearth. In the case of well or like grates where the bottom is level with, or below, the hearth, the rearwardly-extending part may be fitted with depending legs adapted to rest upon the grate bottom.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for July 27.]

Nos. 18,948—19,620.

BRITISH BRASS FITTINGS, LTD.—"Thermostatic control device for gas ovens." No. 19,233.

FAIRWEATHER, C.—"Gas cut-off device." No. 19,362.

LAING, B.—"Distillation of carbonaceous materials." No. 19,619.

MARCH, A. S.—See Fairweather, C. No. 19,362.

NIELSEN, H.—See Laing, B. No. 19,619.

OWENS, J. S.—"Open grates for burning coke." No. 19,505.

POWER-GAS CORPORATION, LTD.—"Gas producing plant." No. 19,253.

RADIATION, LTD.—"Atmospheric gas burners." No. 19,282.

RAMBUSH, N. E.—See Power-Gas Corporation, Ltd. No. 19,253.

WINDERS, G. L.—See Fairweather, C. No. 19,362.

YATES, H. J.—See Radiation, Ltd. No. 19,282.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

Progress of Bills.

Greenock Burgh Extension and West Bromwich Corporation Bills: Returned from the Commons, with the amendments, agreed to.

Leeds Corporation and Birmingham Extension Bills: Read the third time, with the amendments. Further amendments made. Bills passed, and returned to the Commons. Returned by the Commons, agreed to.

Manchester Corporation Bill: Read the third time, and passed; returned to the Commons. Returned by the Commons, agreed to.

Kilmarnock Gas and Water Order Confirmation Bill: Read a second and the third time, and passed; sent to the Commons.

Coventry Corporation, Salford Corporation, Scarborough, and South Staffordshire Mond Gas Bills: Returned from the Commons, agreed to, with amendments, which were considered and approved.

Basingstoke, Bolsover, and Stroud Gas Orders: Approved.

Special Orders.

The Special Orders Committee reported that no petition had been presented against the Colwyn Bay, Earl-Shilton, Exeter, Ipswich, Portsmouth, Richmond (Yorks.), St. Ives (Hunts.), Walton-on-Thames and Weybridge, and Wellington (Somerset) Gas Orders, and that there was nothing in them to which to call the attention of the House. They had also considered the East Hull and Redditch Gas Orders and the proposed additions, and recommended their adoption to the House. These Orders were subsequently approved.

HOUSE OF COMMONS.

Progress of Bills.

West Bromwich Corporation Bill: Lords amendments considered, and agreed to.

Coventry Corporation Bill: As amended, considered; amendments made; read the third time, and passed, with amendments.

Salford Corporation, Scarborough, and South Staffordshire Mond Gas Bills: As amended, considered; read the third time, and passed, with amendments.

Birmingham Extension, Leeds Corporation, and Manchester Corporation Bills: Lords amendments considered, and agreed to.

Walton-on-Thames and Weybridge, Conway, Portsmouth, Wellington (Somerset), and Colwyn Bay Gas Orders: Approved.

Kilmarnock Gas and Water Order Confirmation Bill: Read a second time.

Royal Assent.

Before the adjournment of Parliament on July 29, the following Bills received the Royal Assent: Smethwick Corporation, Bognor Gas and Electricity, Greenock Burgh Extension, West Bromwich Corporation, Coventry Corporation, Scarborough Gas (Consolidation), South Staffordshire Mond Gas, Salford Corporation, Leeds Corporation, Birmingham Extension, and Manchester Corporation.

Scientific Research.

Under Class IV. of the Civil Estimates, 1927, a sum of £117,975 has been granted for Scientific Investigation, and, under Class VI., £291,951 for the Department of Scientific and Industrial Research.

Gas-Regulation Act.

The Special Order of the Bolsover Gaslight and Coke Company was approved, subject to the following modifications:

In Clause 11, after sub-clause (1), insert—

Provided that it shall not be lawful for the Company to carry forward at the end of any year to the credit of the said account any sum exceeding the total of the following amounts (that is to say):

(*a*) The amount required by the Company for paying any dividend or interest which the Company are entitled or required to pay on their capital in respect of the undertaking but have not paid in respect of that year;

(*b*) An amount equal to the total sum which the Company would be lawfully entitled to distribute as dividends on such capital in respect of the next following year, having regard to the price charged by them for gas at the commencement of that year; and

(*c*) An amount equal to the total sum which the Company will be required to pay during the next following year as interest on any mortgages or debenture stock secured on the undertaking.

In Clause 11, omit the proviso to sub-clause (2).

Approval was also given to the Special Order of the East Hull Gas Company, subject to the following:

Insert, after the words "Provided that," in line 12 of clause 6, the words:

(*a*) Notwithstanding anything in this section the price so charged shall not exceed 19·4d. per therm nor 3·2d. per therm above the maximum price from time to time in force within the portion of the limits of supply within the city of Kingston-upon-Hull; and (*b*).

Glasgow Gas Price.

Mr. BUCHANAN asked the President of the Board of Trade if he had received any representation from the Corporation of Glasgow to be allowed to continue the present price of gas; if so, what decision had been arrived at; and when the power to change the present price by the Corporation expires.

Sir P. CUNLIFFE-LISTER replied that officials of the Glasgow Corporation had asked the Board if, in view of the fact that the Corporation read meters continuously instead of quarterly, they would consider making an Order empowering the Corporation to continue to certain consumers the present price of gas until the meter reading next after Dec. 31. It was suggested that those consumers whose meters were read late would not, without such an Order, pay the same increased rate of charge as is paid by those consumers whose meters were read immediately after the increased charge was authorized, and that the proposal, if accepted by the Corporation and authorized by the Board, would spread the increased charge fairly among all consumers. No application for an Order had yet been received, and no decision had, therefore, been reached. The Board were prepared to consider an application, if made. Under the Corporation's present powers, the existing price could be continued to Dec. 31 next.

SCARBOROUGH GAS COMPANY (CONSOLIDATION) BILL.

The Unopposed Bills Committee of the House of Commons (over which Mr. J. FITZALAN HOPE, Chairman of Ways and Means, presides) considered this Bill on Tuesday, July 19. Its provisions were set out in the "JOURNAL" for Jan. 19, p. 145; and the amendments made in the House of Lords were reported in our issue of July 6, p. 42.

Mr. R. H. Fox (Messrs. Torr, Durnford & Co., Parliamentary Agents), dealing with the proposed consolidation of the Company's Acts, said they had not been to Parliament since 1903, and many of the provisions of the existing Acts were obsolete. It seemed desirable, therefore, to repeal those, and to consolidate the provisions which it was wished to keep in force. They were a maximum dividend Company, with a maximum dividend of 5 p.ct. on ordinary stock. They were proposing by the Bill to adopt the thermal basis of charge. The present authorized capital was £349,062, of which £320,555 had been raised; and it was proposed to increase the authorized capital to £400,000. Some £10,600 of the capital had been raised by way of premiums. It was also proposed to increase the borrowing powers. The further capital powers asked for were justifiable on the estimates of capital expenditure necessary.

Sir ERNEST MOON, K.C. (a member of the Committee), referring to the basic price and basic dividend provisions, and the clause inserted in the House of Lords, at the instance of the Board of Trade, requiring the Company to come to Parliament in five years to give an opportunity to review, and if necessary revise, these provisions, said that the scheme was experimental, and Parliament had said, therefore, that the Company should not be allowed to operate it for more than a few years.

Mr. FOX agreed. In the House of Lords, he said, the Board of Trade had submitted a long report on the provisions of the Bill, and the promoters had had many interviews with them in regard to it. There was now a supplementary report from the Board, to the effect that their suggestions had been met, and they had no further objections.

The attention of the Committee was then drawn to a clause providing that no person should be disqualified from being a Director of the Company by reason of his holding any office or place of trust or profit under the Company, or by reason of his being interested in any contract with the Company; but if he were interested in such a contract, the nature of his interest in it must be disclosed to his co-Directors, and he must not vote as a Director in respect of it. It was pointed out that this clause did not go so far as the model clause, which latter provided that not only must a Director interested in a contract disclose the nature of his interest to his co-Directors, and cease from voting, but also that the fact that he was interested in it should be disclosed in the next annual report. There were precedents for the clause as inserted in the Company's Bill; and the Board of Trade were satisfied that the clause was sufficient as it stood. The precedents were the Barnet Gas and Water Act of 1926, the Croydon Gas Act of 1922, and the Worthing Gas Order of 1925, made by the Board of Trade.

Mr. *William Cash* (Messrs. Cash, Stone, & Co., Chartered Accountants), who is advising the Scarborough Company with regard to the promotion of the present Bill, gave evidence, and expressed the view that it was both unnecessary and unusual to provide for it to be stated in the annual report of a company that a Director was interested in a contract. The provision in the Model Bill was a departure from the Companies Clauses Consolidation Act, 1845, which latter was too stringent in that it forbade a Director being interested in such a contract. It did seem a little too much, however, to say that the fact that a Director was so interested should be printed and circulated to the whole body of shareholders.

The CHAIRMAN asked how it would do to provide that the fact should be mentioned at the annual meeting of the Company.

Witness replied that it would be rather invidious.

The CHAIRMAN asked if it would not be equally invidious that it should be disclosed to the Board only, and not to the shareholders.

Witness said the Board would know the whole of the circumstances, and the Director in question could not vote.

Mr. FOX, replying to Mr. George Thorne (a member of the Committee), said at one time the Board of Trade definitely did not agree with the Company as to the insertion of the clause as it stood in the Bill; but they had now intimated that they were satisfied.

The Committee deliberated on the point in private, and it was subsequently announced that they could not depart from the model clause. The clause in the Bill, therefore, was amended in accordance with that decision.

The Bill was ordered to be reported for third reading.

The Vale of Leven Gas Company, Ltd., have decided to pay a dividend of 8 p.ct. (free of income-tax) for the past year.

MISCELLANEOUS NEWS.

NOTTINGHAM GAS PROFITS.

Though at their last meeting the Nottingham Corporation decided, upon the recommendation of the Finance Committee, to standardize, in relief of rates, the proportion of contributions derivable from municipal trading undertakings, of which the principal is that represented by gas supply, the feeling which found expression in the course of the debate was that the proposal is not sound. The Council as a whole were far from convinced as to the reasonableness of the plan, for 17 opposed the adoption of the report, which was carried by 27 votes. There were 20 absentees or abstentions, out of a total of 64 representing the Council.

The result takes out of the hands of the gas and other committees the responsibility of determining the amounts they can reasonably allocate in particular years towards the alleviation of local burdens. The Gas Committee, thanks to the admirable management of their affairs, have been in the position (with one exception, when the amount fell to £25,000) of being able to contribute £30,000 annually for that purpose. Under the plan which has now been ratified, a sum equivalent to a rate of 4½d. in the pound is to be taken from the gas profits yearly.

The same process is to be applied to portions of the surplus revenue of the Electricity and Tramway Departments; 3½d. in the pound being taken from the former, and 4d. from the latter. The arrangement decided upon by the Corporation thus provides for a total contribution from the three undertakings of sums equivalent to a rate of a shilling in the pound, assuming that the produce of a penny rate on the assessable value of property in the city does not exceed £7000. In the event of that maximum being attained, the plan would entail £84,000 being taken annually from the three concerns, of which the gas profits would furnish £31,500.

In support of the Finance Committee's report, it was suggested by Alderman H. G. Ford that, if the Council decided against the contributory principle, they would be acting contrary to the interests of Nottingham ratepayers, and to the advantage of consumers living outside the city, who depended for their gas and electricity supplies, as also for their tramway services, upon municipal resources. The reason, he said, that a larger contribution had been put down in the case of the gas undertaking than in that of the electricity concern was because of the heavy capital charges on the latter, and because the gas undertaking had been able to build up large reserves. Alderman A. Turney, Vice-Chairman of the Tramways Committee, said that the real issue was between an arbitrary profit determined beforehand and real profit represented by a balance-sheet. The proposal had been actuated mainly to suit the convenience of the Finance Committee in preparing their budget. Alderman Sir Bernard Wright commended the proposal, however, on the ground that it would enable the Committees to know on what basis to cost. The report, he suggested, would put an end to the possibility of any increased claims upon the trading undertakings.

MORE LIGHT ON COMPANY PROMOTING.

As Practised at 43, Cannon Street, and Elsewhere.

On more than one occasion recently, we have had the curtain lifted on the methods of procedure of the Company promoters who operated from 43, Cannon Street, and other addresses, with at their head Col. E. O. Eaton. The last occasion was in the "JOURNAL" for July 6 (p. 46), when the affairs of the Wareham Electric Supply Company were dealt with by Mr. H. E. Burgess, Senior Official Receiver. At statutory meetings of the creditors and shareholders, Mr. Burgess has recently been dealing with the affairs of the Electricity Finance and Distribution Corporation. In the course of a statement, he said he was not in a position to give much information, for the reason that Col. Eaton was "apparently" unfit to attend; and this placed him (Mr. Burgess) in some difficulty. It appears that the other Directors took little active part in the Corporation's affairs. They merely did as they were told by Col. Eaton. No proper record of the transactions of the concern had been kept in a minute book. No proper meetings had been held. Someone, however, prepared minutes relating to various transactions, and sent them to the Directors, who signed them. A significant remark was made by Mr. Burgess: "I do not know whether they will get into trouble for their neglect, but they certainly deserve it."

The Corporation was merely a promoting one; and it took over shares of other concerns in which Col. Eaton and his associates were interested. The original capital of the Corporation, which was promoted in April, 1923, was £2000; its purpose being to deal in shares and debentures of other companies, and, having secured control of those concerns, to offer the shares and debentures to the public. Throughout its existence, the Corporation had been under the control of Eaton, and the various officials, and "so-called" Directors, who did not direct, had no control, and merely did as they were told. It was a disgraceful state of affairs. Mr. Burgess gave a list of the companies with which the Corporation had had transactions, and the approximate amounts paid by them to the Corporation for expenses of issue, office accommodation, &c.

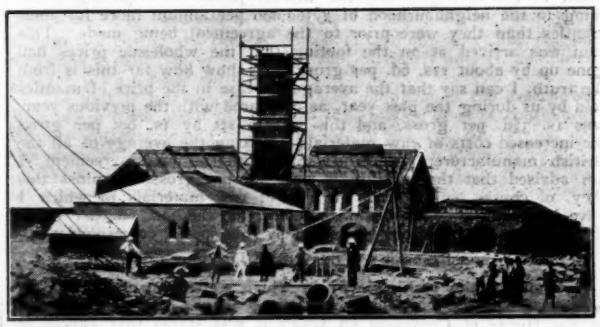
	£
Wareham Electric Supply	2784
Chagford and Devon Electric Light	748
Warwickshire and South Midlands Electricity Supply	6439
Heathfield and Waldron Gas Light and Coke	45
Cambrian Electricity Supply	*Nil*
Naseby and Willingore Gas Light and Coke	754
Electric Light and Power Contracts Finance	1400
Southern Counties Electric Light and Power	6447
South Midlands and Berkshire Electric Light and Power	733
Woolulose Holdings and Investments	120

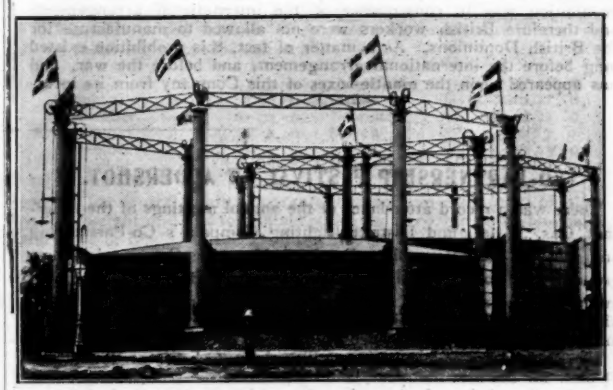
The charge made by the Corporation for the issue of prospectuses on behalf of the companies was from £6 to £8 per £1000, exclusive of postage and printing charges. The persons to whom prospectuses were sent were shareholders in other gas, electric, water, &c., undertakings, whose names and addresses had been obtained from files at Somerset House at a cost of about £1000. [Incidentally, it might be added that lists of shareholders have been obtained from various gas companies by the simple process of someone associated with Col. Eaton or his operations becoming a shareholder to a small extent.] Mr. Burgess also stated that he had a list of transactions showing between £30,000 and £40,000 handled by the Corporation; but until he could get hold of Eaton, he was unable to give accurate details of the receipts or the expenditure, which latter totalled upwards of £48,000. He also mentioned that one of the last acts of the Corporation was to create an issue of £5000 6 p.ct. first mortgage debentures, although possessing nothing upon which to make an effective charge. Apparently the debentures were issued to cover-up and smooth-over certain accounts between the Corporation and Col. Eaton, because the bulk of the bonds were issued to him, and the remainder to a Director who had stated that he accepted them in satisfaction of any claim he might have for services rendered, and he now agreed to waive any claim thereunder. Seeing that the only property so far discovered as belonging to the Corporation is office furniture of the value of about £30, it is unimportant whether or not the claims of the debentures are pressed. Apart from the debentures, the only liabilities were due to unsecured creditors—£197—and to claims for damages sustained by inducements to take-up shares or debentures in the associated companies of the Corporation. The Official Receiver will proceed with the liquidation.

NEW GASHOLDER FOR BOMBAY.

Messrs. Thomas Piggott & Co., Ltd., of Birmingham, have obtained a contract for the supply and erection of a three-lift column-guided gasholder, having a capacity of 1,500,000 c.ft., with steel tank, for the Bombay Gas Company, Ltd.; the three lifts being constructed of "Armco" ingot iron sheets and plates. The inner lift is 138 ft. in diameter by 33 ft. 6 in. deep, and the tank has a diameter of 145 ft. Mr. George Evetts, M.Inst.C.E., is the Consulting Engineer for this work, and Mr. W. T. Lane is the General Manager and Engineer of the Company at Bombay.

It is interesting to record that Messrs. Thomas Piggott & Co. built the original works and plant for the Bombay Gas Company as long ago as 1863.





THE BOMBAY WORKS IN 1863.

Lancaster Gas Department.—Arrangements are being made for a "gas week" at Lancaster to synchronize with the opening of the extension of the gas-works on Sept. 27. The report of the Borough Accountant states that the receipts from the sale of gas were £47,903, or £6608 more than in the previous year. On revenue account, the expenditure was greater by £24,008, of which £20,183 was for coal and oil consequent on the strike. The net loss of the Department was £9573, compared with a profit of £2276 in 1926.

WELSBACH LIGHT COMPANY, LTD.

British Mantle Manufacturers and the Safeguarding Duty.

The Sixteenth Annual General Meeting of the Company was held on Tuesday, July 26, at Welsbach House, Gray's Inn Road, W.C.—Mr. J. R. YATES (the Chairman) presiding.

The SECRETARY (Mr. H. W. Edwards) read the notice convening the meeting; and the report of the Directors [*ante*, p. 180] and the statement of accounts for the financial year ended March 31 last were taken as read.

The CHAIRMAN, in moving the adoption of the report and accounts, said the gas mantle industry had recently been the subject of an attack in Parliament and of big headlines in a certain section of the Press. It was said by the mover of the motion in the House of Commons to reduce the import duty that, as the result of the international arrangement, the wholesale price of mantles had been increased by about 11s. 6d. a gross, and that a bonus of 4s. a gross on all mantles sold had to be paid by English manufacturers to their continental rivals; and, further, that labour is not benefiting, because our English workers are not allowed to manufacture for export to the British Dominions and Colonies. These statements are not true.

When the safeguarding duty was about to come into effect, we learned that foreign manufacturers were proposing to meet the situation by increasing their home price to a very high figure, which they were enabled to do by reason of their high tariff, and that they had also in contemplation certain arrangements whereby the manufacturer for export to this country would receive a subsidy. This would enable them to place mantles on the English market at a price below that at which they could be manufactured here.

INTERNATIONAL ARRANGEMENT.

To avoid this, negotiation took place, and an agreement was ultimately arrived at which gave certain exclusive spheres of influence or trading to each group of manufacturers, the English and the continental. It also gave equal rights in neutral territories.

The continental manufacturers gave up much more trade in surrendering the British market than did British manufacturers. Consequently there had to be some compensation to the continental manufacturers as and by way of equality of exchange of these territories. It is this compensation about which there has been so much outcry by interested parties and political theorists. Any manufacturer will know that a secure market enables him to produce more cheaply than would otherwise be the case, and that increased production generally means an all-round percentage reduction in overhead charges. If British manufacturers can get the whole of the business formerly done by the foreign mantle manufacturer in this country, the price to the consumer will not be raised—subject, of course, to the cost of raw materials remaining normal.

One particularly audacious statement in the Press was that, as a result of the arrangements, the British public were paying something in the neighbourhood of £300,000 per annum more for their mantles than they were prior to the agreement being made. This sum was arrived at on the footing that the wholesale prices had gone up by about 11s. 6d. per gross. To show how far this is from the truth, I can say that the average increase in the price of mantles sold by us during the past year, as compared with the previous year, was 1s. 3¾d. per gross, and this was off-set by 1s. 6d. per gross for increased costs of raw materials. Taking the average of all the British manufacturers concerned in the international agreement, I am advised that the increase is only 1s. per gross. Against this they, of course, suffer from the rise of raw materials to which I have just referred. So much, therefore, for the 11s. 6d. per gross increase and the £300.000 spoken of by this special correspondent.

PEACEABLE CONTINUITY DESIRED.

As showing the reckless way in which statements are made for political purposes, I would recall that a mantle-box was produced in the House of Commons on which it was stated that export to Australia and New Zealand was prohibited. It was said that this prohibition was in consequence of the international arrangement, and therefore British workers were not allowed to manufacture for the British Dominions. As a matter of fact, this prohibition existed long before the international arrangement, and before the war, and has appeared upon the mantle-boxes of this Company from its incorporation. It was a term of the sale of the old Welsbach patents in Australia and New Zealand to another British company, formed for the purpose of exploiting the patents in those Colonies; and it has so remained until this day. Such a prohibition does not apply to other British manufacturers, who can sell in those Colonies to the exclusion of the Continental manufacturers.

The fact is that these reckless statements are made merely with a political object, though the result is damaging to British industry. What we British manufacturers, above all, desire is peaceable continuity. We have suffered six or seven years of political buffetings. Our industry has undergone rigorous examination at the hands of independent Tribunals; and in view of the overwhelming case which we have made out, the measures which have been taken to safeguard the industry and its workers should be allowed to work for a reasonable period without let or hindrance.

DIFFICULT TRADING CONDITIONS.

The year 1926 will ever be remembered as that of the general strike and the coal strike, which latter lasted well over half-a-year, and proved to be the most disastrous industrial upheaval this country has experienced. On trade generally, which had previously shown some sign of revival, the effect has been deadening, and is still being felt. This general result touched us, as it did most trades in the country, but in certain respects it hit us particularly. Our manufacture requires a considerable quantity of fuel, and more particularly of gas. Coal, coke, and gas—these, as you know, were, as the result of the strike, dearer in price, rationed in quantity, and not always good in quality. Then came the lighting restrictions, which naturally affected the use of lighting appliances throughout a great part of the year, and in particular caused a diminution in the sales of mantles below what we had reason to anticipate. Thus our factory was less fully occupied than would otherwise have been the case—a condition of things which, when coupled with increased cost of raw materials, raised the cost of production and more than nullified the slight rise in price we were able to obtain for our mantles. As against these adverse factors, I must add that, during a certain period of the industrial disturbance, the sale of heating stoves, both oil and gas, was stimulated considerably. Of our popular "Handiheaters" the neat portable gas radiator which you have no doubt seen in the adjoining showroom to-day, or will see as you go out—we sold substantially more than in any year since we put this economical heater on the market. In gas heaters and cookers, and in oil heaters and cookers, a considerable business was done. On the other hand, the sale of gas lighting sundries, including burners, brackets, pendants, lamps, and fittings, was smaller in consequence of the coal strike. The business in electrical goods increases, but is capable, as I believe, of much greater expansion, particularly in view of the great electrical schemes of a national character now about to be launched. It is, however, a trade in which there is much price-cutting.

Notwithstanding trading difficulties arising from the strike, our general turnover was well in advance of that of the previous year; and to this fact the substantial increase in our trading profit is largely attributable.

LIQUID ASSETS.

The Chairman then dealt in detail with the accounts, and pointed out, with regard to the liquid assets, that the investments and cash taken together amounted to some £114,000, compared with £120,000 last year. As against this they had an additional £13,000 increase in the credit balance as between debtors and creditors, and a reduction of £4639 in the outstanding debenture stock.

In conclusion, he said that, given freedom from the disturbing causes to which he had alluded earlier in his speech, they might reasonably look for a tendency to more stable conditions, of which their accounts supply evidence. He paid a tribute to the excellent work of the staff, from the General Manager (Mr. Harold Talbot) downwards.

The report and accounts were unanimously adopted; and a dividend of 5 p.ct. (less income-tax) was declared.

Mr. J. R. Yates was re-elected a Director; both proposer and seconder remarking upon the invaluable character of the services rendered by the Chairman to the Company.

CO-PARTNERSHIP FESTIVAL AT ALDERSHOT.

There was a record attendance at the annual meetings of the Aldershot Gas, Water, and District Lighting Company's Co-Partnership and Hospital and Benevolent Funds, held at the Company's sports ground, Ash Road, on July 23, where the proceedings were a happy mixture of business and pleasure—the programme including gymkhana sports and an evening concert. Mr. R. W. EDWARDS, Chairman of Directors, presided over the business meeting.

The co-partnership report stated that the bonus was at the rate of 3½ p.ct. for the first half-year, and 6½ p.ct. for the second half. The total distributed since the inception of the scheme represented £18,346, and the nominal amount of stock transferred now totalled £11,373. The Committee further stated that the Directors had decided to provide for interest on the free portion account at the bank rate, with a minimum of 5 p.ct. instead of 4 p.ct. as formerly.

The report of the Hospital and Benevolent Fund Committee stated that the total subscriptions received during the year amounted to £176, of which £90 had been allocated to hospitals, &c.

The CHAIRMAN, in moving the adoption of the report, said that they had enjoyed co-partnership for seventeen years, during which time nearly £20,000 had been divided among the co-partners. Co-partnership was intended to encourage and bring into actual partnership men and women who had goodwill for their fellow creatures, and who, by joint effort, pulled in the interests of the undertaking, thus benefiting, besides themselves, the public and those who had to find the money to build up the business. The savings account had, since it was established in 1913, had a sum paid in of nearly £12,000. The Hospital and Benevolent Fund, to which considerable value was attached by the Directors, had been established since 1917.

Mr. T. A. BRADDOCK (Deputy Chairman), in seconding, associated himself with what the Chairman had said with regard to co-partnership, and paid a tribute to the very beneficial work being done by the Hospital and Benevolent Fund.

Lord WOLMER congratulated the Company and the Committee on the manner in which the co-partnership scheme had been carried on for seventeen years. He remarked that he had never been able to understand why co-partnership was so largely limited to the gas industry. Though co-partnership was strongly established in all the leading gas companies in the country, it was not getting the same place, unfortunately, in other departments of industry.

The Sheffield Gas Company's Cricket Team have been successful in winning the Sir Frederic Sykes Charity Cup in a knock-out competition in which were entered many of the premier cricket teams of Sheffield and district.

GAS REGULATION ACT APPLICATIONS.

SPECIAL ORDERS.

Cockermouth Urban District Council.

To authorize the Council to acquire and utilize for gas purposes scheduled lands; to charge for gas on a calorific basis; to confer further general powers upon them; and to enable them to borrow money.

Hemel Hempstead District Gas Company.

To empower the Company to raise additional capital; and to make other new provisions.

Otley Gas Company.

To authorize the Company to raise additional capital, to establish profit-sharing and co-partnership schemes, and to supply gas in bulk.

COAL TRADE REPORTS.

From Our Own Correspondents.

NORTH-EAST COAST.

The improved tone recently noticeable in the market has continued during the past week, and a more optimistic feeling prevails than for some time. There cannot be said to be any definite improvement in trading conditions, unless it is that the restricted output is more in keeping with the orders that are available. It is also difficult, unfortunately, to find any concrete reason for the better tone, except that inquiries for forward business, especially over the next few months, have been more hopeful. Many collieries are still short of prompt trade, and living from hand to mouth; but there is a disposition either not to quote at all, or to quote higher than current prices, for forward business.

Gas coals, especially the better sorts, have been in slightly improved demand, and are steadier. Wear Specials quote 16s. 6d., and best qualities ask 16s. to 16s. 3d. f.o.b. Seconds are also, if anything, better off for trade, and 13s. 9d. to 14s. 6d. is the current price. Unscreened coking is nominally 14s. to 14s. 6d. Durham bunkers are 14s. 6d. to 15s. 3d. for better sorts, and 13s. 6d. to 14s. for seconds. Northumberland steams are slightly harder at 14s. 3d. for best screened sorts, but they are quoting at least 14s. 6d. for forward. Gas coke for shipment is firmer, and 20s. f.o.b. is asked.

The recently published ascertainments, governing wages for August, show how very serious have been the losses in recent months. Though it is too soon to say that the corner has been turned, hopes are running high that better times are coming, though prices have some way to go before they can be considered remunerative. In addition to seams and whole pits that are closed, most of the collieries are working short time.

YORKSHIRE AND LANCASHIRE.

Coal traders in Yorkshire and Lancashire report that some gas concerns are buying well ahead—in some instances to the latter part of next year. This is taken as an indication that prices are lower to-day than they are likely to be in 1928. Some very much cut quotations are said to be before many gas concerns for acceptance during the next few weeks. There is a probability of a slight hardening towards the end of August.

The approach of the holidays rather retarded the steadying in the demand for domestic coal, but, generally speaking, the position is not altogether unsatisfactory, taking into consideration the period of the year and the lack of export orders. The situation may be a little worse during the next few weeks; but in many instances collieries are observing the Bank Holidays.

The industrial position does not improve, although some factories are stocking small quantities; but values are low and appear likely to remain so for the time being.

The export market is featureless, with very little new business on inquiry.

The following are the Humber bunker and export prices, f.o.b. usual shipping ports: South Yorkshire—Hards, Association, 16s. to 16s. 6d.; screened gas coal, 15s. 6d. to 16s.; washed trebles, 17s. to 18s.; washed doubles, 16s. to 16s. 6d.; washed singles, 15s. 6d. to 15s. 9d.; washed smalls, 12s. 6d. to 12s. 9d.; rough slack, 10s. 6d. to 11s.; smithy peas, 17s. to 18s. per ton. West Yorkshire—Hartley's (f.o.b. Goole) 15s. to 15s. 9d.; screened gas coal, 15s. to 15s. 9d.; washed trebles, 16s.; washed doubles, 15s. to 15s. 6d.; washed singles, 15s.; washed smalls, 12s. 6d. to 13s.; unwashed trebles, 15s. to 15s. 6d.; unwashed doubles, 13s. 6d. to 14s.; rough slack, 12s. 6d. to 12s. 9d.; coking smalls, 11s. to 11s. 3d. per ton. Derbyshire and Nottinghamshire—Top hards, 17s. 6d. to 18s.; washed doubles, 16s. to 16s. 6d.; washed singles, 15s. 3d. to 15s. 9d.; washed smalls, 12s. 3d. to 12s. 9d.; rough slack, 11s. 6d. per ton. Yorkshire, Derbyshire, and Nottinghamshire—screened steam coal, 14s. to 14s. 6d.; gas coke, 19s. to 21s. 6d.; furnace coke, 19s. to 19s. 6d. per ton.

Average prices in Lancashire: Best Lancashire house coal, 32s. to 33s.; seconds, 29s. to 30s.; kitchen, 22s. to 24s.; common, 19s. to 21s.; Yorkshire Haigh Moor house, 28s. to 30s.; best house, 30s. to 32s.; and house, 20s. to 21s. per ton into wagons at pit.

MIDLANDS.

Trade in Warwickshire and Staffordshire coalfields has been quiet during the past week. With the realization that prices are not likely to fall further, householders for some time have been laying in stock; but with the approach of the holidays this was suspended, and very little in this direction will be done during the next two or three weeks.

All industrials are also quiet. Most of the consuming industries are experiencing a thin time, though there are hopes that autumn will see a revival. D.S. nuts are plentiful at 12s. to 14s. at pitheads, and nutty slacks at from 8s. to 10s. Very fine slacks are quoted down to 5s. Most of the pits will make a start about Wednesday or Thursday, but a large output is not to be looked for this week.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *July* 30.

A moderate amount of business is reported in pitch, and the price continues firm at 87s. 6d. to 90s. per ton net f.o.b. makers' works.

Creosote also is steady at about 8¼d. per gallon, in bulk.

Pure benzole is about 1s. 7d. per gallon, pure toluole about 2s. per gallon, and 95/160 solvent naphtha about 1s. 5d. to 1s. 5½d. per gallon.

Tar Products in the Provinces.

Aug. 2.

Markets for tar products have been quiet during the past week. Pitch is very firm indeed, although there is little actual business doing with consumers, except for immediate delivery in South Wales. For Continental inquiries, dealers are quoting on the basis of 90s.; but there is no evidence that this figure has been paid.

Creosote is steady, with a good demand for both prompt and forward delivery.

Water-white products remain dull in sympathy with the petroleum market.

Crude carbolic is firm. For immediate delivery, 2s. 5d. f.o.b. is obtainable; while for October/December, 2s. 4½d. would probably be paid. Up to now, crystals have not responded to the improvement in crude; but there is a fair amount of inquiry, and better prices are looked for.

Cresylic acid is steady, and there is a special demand for American grade.

The average values of gas-works products during the week were: Gas-works tar, 61s. 6d. to 66s. 6d. Pitch—East Coast, 85s. to 87s. 6d. f.o.b. West Coast—Manchester, 80s. to 82s. 6d.; Liverpool, 82s. 6d. to 85s.; Clyde, 84s. to 86s. 6d. Benzole, 90 p.ct. North, 1s. 2d. to 1s. 3d.; crude, 65 p.ct. at 120° C., 10¼d. to 10½d., naked, at makers' works; 50-90 p.ct., naked, North, 1s. 3d. to 1s. 4d. Toluole, naked, North, 1s. 4d. to 1s. 5d. nominal. Coal-tar crude naphtha, in bulk, North, 7¼d. to 8d. Solvent naphtha, naked, North, 10¼d. to 11¼d. Heavy naphtha, North, 1s. to 1s. 1d. Creosote, in bulk, North, liquid, 7¼d. to 7½d.; salty, 7d. to 7¼d.; Scotland, 7¼d. to 7½d. Heavy oils, in bulk, North, 8¾d. to 9¼d. Carbolic acid, 60 p.ct., 2s. 4¼d. to 2s. 5d. prompt. Naphthalene, £11 to £14; salts, £5 to £5 10s., bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" quality, unsaleable.

SULPHATE OF AMMONIA PRICES.

Season 1927-28.

Nitram, Ltd., in the course of a circular letter say:

"We give you below the prices at which we are prepared until further notice to book orders for sulphate of ammonia for home agricultural use during the present season. Our new price for August represents a reduction of £2 8s. per ton, or nearly 20 p.ct. compared with the price for last spring.

"The unit of nitrogen in sulphate of ammonia at the average of these prices costs about 9s. 11d., so that nitrate of soda containing 15¼ p.ct. nitrogen would have to be sold at £7 13s. 6d. per ton delivered to your nearest station to be on the same level.

"We reserve the right to raise our prices at any time by sending out a printed notice to that effect. Any such increase in price will apply to all orders received after the date of issue of the notice.

"As the railway companies are now aiming at making 6 tons the standard truck-load for fertilizers, we are basing our prices on 6 ton lots with 1s. per ton extra for lots under 6 tons but not under 4 tons, and with a further 4s. per ton extra for lots of less than 4 tons but not under 2 tons. There will be no allowance for taking delivery *ex* works.

"As practically no ordinary quality is likely to be available, we refrain from quoting a price for this quality.

"We offer to sell sulphate of ammonia for home agricultural use at the following prices for delivery in:

1927.	£	s.	d.	1928.	£	s.	d.
August	9	18	0	January	10	11	0
September	10	0	0	February	10	13	0
October	10	2	0	March	10	13	0
November	10	5	0	April	10	13	0
December	10	8	0	May	10	13	0

per ton for neutral quality guaranteed to contain 20·60 p.ct. of nitrogen by weight and not to contain more than 0·025 p.ct. of free acid, and to be in readily friable condition at the time of delivery, delivered to consumer's nearest station or wharf in Great Britain (or f.o.b. British port when the ultimate destination is Isle of Man) for prompt cash payment in lots of 6 tons and upwards, packed in single bags containing about 2 cwt. net to be supplied free by sellers, tare allowed. When credit is given, a reasonable extra charge may be made, but the discount allowed for prompt payment should be quoted on the invoice. The above prices will also apply to deliveries of 1 ton and upwards *ex* works or *ex* store to buyers' road vehicle."

A statement of conditions follows.

TRADE NOTES.

Wilton Still for Beckton.

The Chemical Engineering and Wilton's Patent Furnace Company, Ltd., have received instructions from the Gas Light and Coke Company to instal one of the largest liquor stills which has been constructed—namely, one capable of treating 3000 gallons of gas liquor per hour, the steam consumption being very low—at the Tar and Ammonia Products Works, Beckton.

CONTRACTS OPEN.

Coal.

The Goole Urban District Council are inviting tenders for the supply of gas coals. [See advert. on p. 295.]

Middlesbrough's Cheap Gas.

The following is an extract from the "North-Eastern Daily Gazette" for Tuesday, July 26: The effect of the promised reduction of 4d. per 1000 c.ft. in the price of Middlesbrough gas will be that the Borough can claim to supply the cheapest gas in the country. That is no mean achievement. In the household it will give a definite impulse to the adoption of gas cooking and gas heating, with all their advantages in health and cleanliness; while to the manufacturers, large and small, who use gas engines it involves a sensible saving in works costs. The cheapness of gas is largely due to the utilization of coke oven gas, in which enterprise Middlesbrough gave a lead to the world; but a certain amount of coal gas is also used, and as a result of the extra costs attributable to the coal strike there was an advance in price. Now the Corporation are reverting to the pre-strike price of 2s. 2d. per 1000 c.ft. Would that all municipal enterprises could show such satisfactory results.

Cheaper Gas at Barrow.—The Barrow-in-Furness Gas Committee have decided upon a reduction in the price of gas to 4s. 3d. per 1000 c.ft., from the September meter readings.

Reduction in Price at Shrewsbury.—The Shrewsbury Gas Light Company announce that, as from the last reading of the meters, the price of gas to ordinary consumers will be reduced to 11d. per therm, which is equivalent to 4s. 2½d. per 1000 c.ft.

Tottenham Gas Company's Dividend.—There was an unfortunate printer's error on p. 232 of last week's "JOURNAL," in the statement of the dividend declaration by the Tottenham District Light, Heat, and Power Company, in respect of the half-year ended June 30. The dividend on the "B" stock is at the rate of 6½ (£6 2s. 6d.) p.ct. per annum, and not 6½ p.ct. as there set forth.

Success of the Davis Bowling Club.—This summer the Club have won not only the "Harmsworth" County Cup, but also the Rink, Pairs, and Singles Championships of Bedfordshire. No other Club, we are informed, has previously won all the County championships. The Davis team will represent Bedfordshire in the Inter-County Bowls Championship of England at Hastings during this month.

Devon Gas Association, Ltd.—The Directors are inviting applications for 800 ordinary shares of £10 each and £4000 5 p.ct. first mortgage debentures (for a term of ten years) to rank *pari passu* with the existing £7500. Since 1917 the make of gas has doubled. The object of the issue is to provide further working capital, and primarily for the purchase of the undertaking at Lyme Regis, a rapidly developing seaside resort.

Wandsworth, Wimbledon, and Epsom District Gas Company.—The Directors have declared a dividend for the half-year ended June 30, at the following rates p.ct. per annum: On the 5 p.ct. preference stock, 5 p.ct.; on the Wandsworth "A" stock, £8 10s. p.ct.; on the Wandsworth "B" stock, 7 p.ct.; on the Wandsworth "C" stock, £5 19s. p.ct.; on the Wimbledon stock, £6 12s. 6d. p.ct.; on the Epsom stock, £7 2s. 6d. p.ct.; and on the new ordinary stock, £5 19s. p.ct. The warrants will be payable on Aug. 16.

Metropolitan Gas Company of Melbourne.—Messrs. John Terry & Co., of 7, Great Winchester Street, E.C. (as Agents for the Company) inform us that they have received a cablegram from the Metropolitan Gas Company of Melbourne, to the effect that the net profits for the six months to June 30 last were £105,500. A dividend of 7s. 6d. per share has been declared; an amount of £10,000 has been transferred to reserve account; and a sum of £85,780 has been carried forward. Dividends were payable in Melbourne probably on Aug. 1; and those to absentee shareholders will be posted by an early mail.

Sports at Leamington.—The Leamington Gas-Works Cricket Club Sports were held on Saturday, July 24, at the St. John's Ground, Tachbrook Road. This is the first occasion for many years on which the sports have taken place; and they were acclaimed by all present as a great success. The first event was a cricket match by two teams representing the Staff and the Works and Distribution Department, the latter team winning by 28 runs. The match was followed, after an interval for tea, by athletic events. Mr. R. S. Ramsden (General Manager and Engineer of the Leamington Priors Gas Company) presented the prizes (given by members of the staff) to the successful competitors; and the proceedings were concluded with a vote of thanks to Mr. Percy Hiorns for his kindness in permitting the use of his field and for the interest he had taken to make the event a success.

Lambeth's Improved Street Lighting.—At a recent meeting of the Lambeth Borough Council, a report was presented to the Council by the Lighting Committee, which stated that the Borough Engineer had reported that the problem of installing clocks in the South Metropolitan Gas Company's area was a difficult one, owing to the existence of 3144 upright burners, and the need to replace 1367 obsolete lanterns which were unsuitable for the fixing of clocks. To remove these conditions, convert the burners, and instal clocks would entail an expenditure of £17,469. The Chairman of the Committee informed the Council that the South Metropolitan Gas Company were willing to meet the capital cost of the new lanterns, burners, and installation of clocks. The Company were willing to accept repayment, without interest, by instalments, spread over (say) ten years, of approximately £1747 per annum. The Company were also prepared to allow the Council the saving in lighting, extinguishing, and maintenance, estimated at £1707 per annum. He was of opinion that the Council should accept the offer, as the matter had been considered at some length, and they would derive much advantage. The offer was accepted.

West's "Gala Day."—"West's Gas," the official organ of West's Social Society, have published a special "Sports and Gala" number, to record their successful sports gathering this year.

Lea Bridge District Gas Company.—The Directors have declared a dividend for the half-year to June 30 last at the rate of 7 p.ct. per annum on the consolidated ordinary stock, payable on Sept. 1 next, less income-tax. They have also decided to reduce the price of gas, as from the Michaelmas meter readings, from 9½d. to 9d. per therm.

Reduction in Price Recommended at Lytham.—The Lytham St. Annes Gas Committee recommend a reduction in the price of gas by 6d. per 1000 c.ft. The sum of £2000 will be transferred from the net revenue appropriation account to gas reserve fund, leaving in the appropriation account £2648. Permission is being sought to borrow £25,000 for mains, meters, and stoves.

Solignum, Ltd., has been registered to acquire from Messrs. Major & Co., Ltd., the goodwill of the "Solignum" branch of their business, and to carry on the business of manufacturers of, contractors for, and dealers in chemicals and all chemical products, dyes and dyestuffs, tar distillers, &c. The nominal capital is £150,000, in 100,000 preference shares of £1 and 200,000 ordinary shares of 5s.

Low-Temperature Carbonisation.—The "Financial Times" is officially informed that Low-Temperature Carbonisation has completed its first production of solid smokeless fuel, "Coalite," from its new works at Barnsley, and has sold its first parcel of 500 tons at a price 50 p.ct. above that of best domestic house coal. It is further stated that the fuel oil produced by the Company's process is of exceptional quality, and is selling at double the price previously obtained for this commodity.

Finsbury Gas Meter Testing Office.—The report of the Public Control Committee (No. 1), submitted at last week's meeting of the London County Council, states that the recent requirements of certain London gas companies that meters to be installed by them should be stamped by the Council's inspectors have resulted in a considerable increase in the number of meters dealt with at the three testing offices during the past few years. In order to cope with this work, the Committee are of opinion that two additional gasholders should be purchased for use at the Finsbury gas meter testing office. The proposal was carried.

Unfenced Wheel at Smethwick.—At Smethwick recently, the Incandescent Heat Company, Ltd., were summoned for failing to keep certain machinery, dangerous to persons working in their factory—namely, an abrasive wheel—securely fenced, as required by the Factory and Workshops Acts. The Magistrate imposed a fine of £25. Mr. H. A. Hepburn (an Inspector of Factories), prosecuting, said that an employee was killed by the bursting of a wheel. The man was engaged in grinding a piece of metal, when, without warning, the abrasive wheel burst into several pieces. Mr. Donald Finnemore (who represented the firm) entered a plea of guilty to a technical offence. He said there was a steel guard fitted to the wheel two years ago; but there was no doubt that on that particular day it was not in use. No one knew why the wheel broke. It was comparatively new, having been fitted only a month, and had passed all tests.

A proposal to decrease the price of gas will be submitted at to-day's meeting of the Manchester City Council.

The price of gas at Blackpool, now 2s. 1½d. per 1000 c.ft., is likely to be reduced at the end of the present quarter.

The Walsall Town Council are to be asked to give sanction to a proposal to extend the gas mains to give a supply to the new housing sites at Four Crosses, Ida Road, and Beatrice Street, at an estimated cost of £3847.

Some months ago Mr. A. H. Bennett, an employee of the Stafford Corporation Gas Department, saved two children from drowning in the River Sow. In recognition of his conduct, the Gas Committee have granted him five guineas, and the Royal Humane Society have awarded him a certificate.

At the annual Royal Lancashire Agricultural Show, which opened at Bolton on July 28, the Bolton Gas Department exhibited a number of useful gas appliances. There were a well-equipped bathroom and a kitchen; gas used for central heating, cooking, and sterilizing dairy utensils; and gas heated apparatus for confectioners.

Employees of the St. Austell and St. Blazey Gas Company had their annual outing on Wednesday, July 13, when they visited Plymouth by motor bus. The lunch was presided over by Mr. H. E. Riley (the Engineer and Manager of the St. Austell Company); and he was supported by Messrs. B. Davey, Roberts, F. Nettle, and R. S. Wherry.

The cricket teams of the Sheffield Gas Company and the Nottingham Corporation Gas Department had their annual match at Nottingham on Saturday, July 23. The Sheffield team were the winners on this occasion. A large party went from Sheffield to Nottingham, and were hospitably entertained at tea by their hosts on the new sports ground; a most enjoyable afternoon being spent. The ladies of the Sheffield party were taken for a drive to places of interest in Nottingham during the afternoon.

A suggested scheme for the supply of gas to Sully, presented by the Parish Council, was not entertained by the Barry Gas, Water, and Electricity Committee. The Engineer, Mr. T. E. Franklin, stated that he had made a survey of the requirements of the eighty probable consumers, and an optimistic estimate of the greatest quantity of gas that might be consumed in the district would be about 4 million c.ft. per annum, and the total revenue would be only £367. The annual repayments of interest and principal on the larger mains and services required to cover the area would be about £880, which meant an annual loss of £312.

STOCK MARKET REPORT.

A HOLIDAY atmosphere prevailed on the Stock Exchange last week. All markets were quiet, and the business done was mostly confined to specialities. As was anticipated, there was considerable monetary pressure, but the position in this respect eased towards the close of the week. British Funds and Gilt-edged stocks generally remained firm; and there were improvements in Indian Government issues. Foreign stocks were irregular, and the recent European issues declined, especially Austrian 6 p.ct.'s, which fell to 99½. Home Rails were a little more encouraging; the disappointment over the Metropolitan and North-Eastern preference dividends being discounted by the Midland, Great Western, and Southern announcements.

In the Industrial Market, while active features were not wanting, business was on the small scale. Banks, Insurance, and some Shipping shares were in demand, and there was selling of Guinness shares on the reduced dividend.

It will be seen from the Table that there were numerous changes in the quotations of Gas Stocks and Shares, and, apart from *ex* div. markings and slight declines in three foreign companies' quotations, they all showed improvements. Brighton 6 p.ct. and 5 p.ct., British ordinary, Commercial ordinary, Lea Bridge 5 p.ct., Sheffield "A," "B," and "C," South Metropolitan, and Tynemouth stocks all benefited. The interim or half-yearly dividend announcements are gradually being made. Among last week's list was Lea Bridge 5 p.ct. at 7 p.ct., being ½ p.ct. above the rate for the corresponding period of 1926; while the South Suburban and Wandsworth companies announce similar dividends to those paid in 1926. An item of interest to gas investors is the news from Australia that the Metropolitan Gas Company (Melbourne) have declared a dividend of 7½ p.ct.; the net profits for the six months to June being £105,500, against £113,400 for the first half of 1926.

The following transactions were recorded during the week:

On Monday, Bournemouth 6 p.ct. preference 11¼, 11⅜, 4 p.ct. debenture 77, British 109½, Continental Union 35, European 6½, Gas Light and Coke 88, 88⅛, 88¼, 88½, 88¾, 3½ p.ct. 60⅜, 4 p.ct. preference 77⅜, 77½, 77⅝, 5 p.ct. debenture 99½, Imperial Continental 138½, Montevideo 91½, Primitiva 17s. 4½d., 17s. 6d., 17s. 7½d., 17s. 9d., 17s. 10½d., 18s., 4 p.ct. debenture (1911) 70½, South Metropolitan 102½, 103. Supplementary prices, Bournemouth 7 p.ct. debenture 104, 104½, Liverpool 5 p.ct. 85¼, 87⅜, North Middlesex 6 p.ct. preference 105, South Metropolitan 6 p.ct. preference 109¾.

On Tuesday, British 108, 110, Commercial 87, 87½, European 6⅜, Gas Light and Coke 88⅜, 3 p.ct. debenture 58¾, 59, 59½, 6 p.ct. debenture 102½, 5 p.ct. debenture 99½, 99½, Liverpool 7 p.ct. preference 103½, Primitiva 17s. 6d., South Metropolitan 102½, 103, 3 p.ct. debenture 58⅛. Supplementary prices, Liverpool 5 p.ct. 85⅜, Mid-Kent 60s., North Middlesex 6 p.ct. preference 104½, South Metropolitan 6 p.ct. preference 110.

On Wednesday, Alliance and Dublin 4 p.ct. debenture 66, Commercial 87⅜, 88, Gas Light and Coke 88, 88¼, 5 p.ct. debenture 99⅜, Imperial Continental 139, 140, 141, Primitiva 17s. 6d., South Metropolitan 103, 103¼, 103⅜, South Suburban 5 p.ct. 104½, 105. Supplementary prices, Derby 5 p.ct. 105⅛, 105½, 106, Herne Bay 6½ p.ct. preference 5¼, Liverpool 5 p.ct. 85⅛, South Metropolitan 6 p.ct. preference 109¾.

On Thursday, Alliance and Dublin 85⅜, British 108¾, 109, Cape Town 7⅛, 8, Commercial 87, Gas Light and Coke 86½, 86¾, 87 *ex* div., 4 p.ct. preference 76½ *ex* div., 3 p.ct. debenture 60, 6 p.ct. Brentford debenture 103½, 5 p.ct. debenture 99⅜, Imperial Continental 138⅜, Lea Bridge 97, Primitiva 17s. 3d., 17s. 4½d., South Suburban 5 p.ct. debenture 94⅜.

On Friday, Bombay 21s. 9d., British 109¼, 109⅜, Cape Town 8⅛, 8 3/16, 4½ p.ct. preference 6⅜, Commercial 3 p.ct. debenture 57⅛, Continental Union 34¼, 34½, 35, 7 p.ct. preference 85, Gas Light and Coke 86, 86⅛, 86⅜, 86¾, 3½ p.ct. maximum 59¾, 4 p.ct. preference 76, 5 p.ct. debenture 99⅜, Primitiva 17s., 17s. 1½d., 17s. 3d., 17s. 6d., 4 p.ct. debenture (1911) 71½, 72, South Metropolitan 103½, 3 p.ct. debenture 59, South Suburban 5 p.ct. 103, 104, Tottenham "B" 91, Uxbridge 5 p.ct. 86. Supplementary prices, Herne Bay 6½ p.ct. preference 5¼, Liverpool 5 p.ct. 85, South Metropolitan 6 p.ct. preference 109, 110½, Sutton 105½.

The shortage of money in Lombard Street at the beginning of the week was relieved towards the close. Loans were in keen demand, but the rate for new money fell to 3 p.ct. Discount quotations were virtually unaltered, and the average rate of allotment of Treasury Bills—£4 6s. 8·29d. p.ct.—showed no material change on the previous week's rate.

Foreign Exchange rates at the close of the week showed little variation. The dollar-sterling was firm, and finished 7/32 higher at 4.85 19/32; French francs remained at 124 1/16; Italian lire were quoted a shade harder at 89 9/32; and the Dutch rate at 12.11 13/16. Spanish pesetas were slightly dearer at 28.48; and Belgas were unchanged.

Silver was slightly firmer at 25 5/8d. per oz.; and Gold remained nominally at 84s. 11½d.

The Bank Rate is 4½ p.ct., to which it was reduced from 5 p.ct. on April 21. The banks' deposit rate is 2½ p.ct., and the deposit rates of the discount houses are 2¼ p.ct. at call and 2¾ p.ct. at notice.

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf.Yr	Dividends. Last Hf. Yr.	NAME.	Quotations. July 29.	Rise or Fall on Week.	Transactions. Lowest and Highest Prices.
£			% p.a.	% p.a.				
171,978	Stk.	Feb. 10	5	5	Aldershot 5 p.c. max. C.	70—73	..	..
			4	4	Do. 4 p.c. Pref.	68—71	..	..
833,992	,,	Apl. 7	6½	7	Alliance & Dublin Ord.	84—87	..	85⅜
1,551,888	,,	July 14	4	4	Do. 4 p.c. Deb.	64—67	..	66
374,000	,,	—	—	—	Barnet Ord. 7 p.c.	101—104	..	..
522,654	,,	Apl. 28	1/7½	1/7½	Bombay, Ltd.	1—1½	..	21/9
800,000	1	Mar. 10	8½	8½	Bournemouth 5 p.c.	19⅜—19½	..	..
170,000	10	,,	7	7	Do. B 7 p.c.	12¼—12⅜	..	..
500,050	10	,,	6	6	Do. Pref. 6 p.c.	11—11½	..	11⅛—11⅜
275,000	10	,,	3	3	Do. 3 p.c. Deb.	54—57	..	..
50,000	Stk.	June 29	4	4	Do. 4 p.c. Deb.	74—77	..	77
162,025	,,	,,	—	—	Brighton & Hove 6 p.c. Con.	108—109	+1	..
357,900	,,	—	—	—	Do. 5 p.c. Con.	94—97	+2	..
341,800	,,	July 28	5	5	Bristol 5 p.c. max.	84—85a*	−2	..
1,287,800	,,	Mar. 24	8	7	British Ord.	108—111	+1	108—110
885,000	,,	June 29	7	7	Do. 7 p.c. Pref.	112—117	..	..
100,000	,,	,,	4	4	Do. 4 p.c. Red. Deb.	73—78	..	..
120,000	,,	,,	—	33/2	Do. 5 p.c. Red. Deb.	94—96	..	..
200,000	,,	,,	6	8	Cape Town, Ltd.	7⅛—8	..	7 1/16—8 3/16
100,000	10	May 26	4½	4½	Do. 4½ p.c. Pref.	6—7	..	6⅝
100,000	10	Apl. 28	4½	4½	Do. 4½ p.c. Deb.	70—75	..	..
150,000	Stk.	June 29	6	6	Cardiff Con. Ord.	97—100*	−2	..
626,860	,,	July 28	7½	7½	Do. 7½ p.c. Red. Deb.	99—102	..	..
287,860	,,	June 29	5	6½	Chester 5 p.c. Ord.	86½—91½b	..	..
157,150	,,	Feb. 24	12/-	12/-	Colombo Ltd. Ord.	29/—31/-	..	..
79,185	1	Apl. 28	1/4½	1/4½	Do. 7 p.c. Pref.	20/—22/-	..	..
24,495	1	,,	1/6½	1/6½	Colonial Gas Assn. Ld. Ord.	24/6—26/6	..	..
821,490	1	Apl. 7	1/9½	1/9½	Do. 8 p.c. Pref.	20/—22/-	..	..
178,900	1	,,	1/7½	1/7½	Commercial Ord.	86½—88½	+½	87—88
2,073,280	Stk.	July 14	—	5	Do 8 p.c. Deb.	56—59	..	57½
475,000	,,	June 16	8	8	Continental Union, Ltd.	34—37	−1	34½—35
600,000	,,	Sept. 30	‡2	‡1	Do. 7 p.c. Pref.	84—86	+3½	85
300,000	,,	Mar. 10	7	7	Croydon sliding scale	97—100	..	..
787,560	,,	Mar. 10	6½	6½	Do. max. div.	78—81	..	..
408,100	,,	,,	5	5	Derby Con.	104—106a	..	..
491,270	,,	Feb. 24	8	9	Do. Deb.	73—75c	..	..
55,060	,,	June 29	4	4	Do. Deb.	76—80	..	..
309,000	,,	Mar. 10	5	5	East Hull Ord. 5 p.c.	90—95	..	..
50,000	,,	June 16	5	5	Eastbourne 5 p.c. Deb.	6⅛—6⅜	−⅛	6⅜—6⅝
1,009,180	10	Mar. 24	†3	†3	European, Ltd.	85—87*	−1½	86—88⅜
18,747,460	Stk.	July 28	5	5	Gas Light & Coke 4 p.c. Ord.	59—61*	−1	59⅝—60⅜
2,500,000	,,	,,	8½	8½	Do. 8½ p.c. max.	74—76½*	−1½	76—77⅜
4,197,020	,,	,,	4	4	Do. 4 p.c. Con. Pref.	58—60	+½	58⅜—60
5,602,620	,,	June 16	3	3	Do. 3 p.c. Con. Deb.	100—103	..	102¾—103¼
181,315	,,	,,	6	6	Do. 6 p.c. Br'tf'd Ed. Db.	98—100	..	99¼—99⅝
1,642,770	,,	,,	8	8	Do. 5 p.c. Red. Deb.	..	..	..
42,000	,,	—	7½	7½	Do. 7½ p.c. Ilford Deb.	..	..	..
62,500	,,	Mar. 10	6½	6½	Hastings & St L. 5 p.c. Con	90—92	..	..
958,740	,,	,,	5½	5½	Do. 5½ p.c. Conv.	67—72	..	..
70,000	10	Apl. 28	†10	†10	Hongkong & China, Ltd.	13—13	..	..
173,200	Stk.	Mar. 10	5	5	Hornsey Con. 5½ p.c.	67—69	..	..
1,976,000	,,	May 12	10	10	Imperial Continental Cap.	139—141	+1	138⅜—141
223,130	,,	Feb. 10	8½	8½	Do. 8½ p.c. Red. Deb.	69—71	..	..
225,242	,,	Mar. 10	6½	6½	Lea Bridge 5 p.c. Ord.	95—98	+1	97
2,145,907	,,	Feb. 24	5½	5½	Liverpool 5 p.c. Ord.	85—86b	..	..
400,000	,,	Sept. 30	7	7	Do. 7 p.c. Red. Pref.	103—105b	..	..
165,786	,,	Feb. 24	9	8	Maidstone 5 p.c. Cap.	110—115	..	..
69,480	,,	June 16	3	3	Do. 3 p.c. Deb.	50—55	..	..
75,000	5	June 16	†7	†8	Malta & Mediterranean	5—5½	..	..
541,920	Stk.	May 26	†5	†7	Montevideo, Ltd.	90—92	..	91½
2,061,815	,,	July 28	5	5	Newcastle & Gateshead Con	73—74d*	−½	..
360,920	,,	,,	4	4	Do. 4 p.c. Pref.	66½—67½d*	−1½	..
691,705	,,	June 29	8½	8½	Do. 8½ p.c. Deb.	66½—67½d	..	..
131,185	,,	,,	—	—	North Middlesex 6 p.c. Con.	91—93	..	..
800,000	,,	Apl. 28	9	7	Oriental, Ltd.	100—102	..	..
188,120	,,	June 21	7½	7½	Plym'th & Ston'house 5 p.c.	102—107	..	..
414,500	,,	Feb. 24	7½	7½	Portsm'th Con. Stk. 4 p.c. Std.	102—105	..	..
286,732	,,	,,	5	5	Do. 5 p.c. max.	76—79	..	..
2,389,909	1	—	—	—	Primitiva Ord.	17/—18/-	−/6	17/—18/-
282,200	100	June 1	4	4	Do. 4 p.c. Red. Deb.	84—86	..	..
800,000	Stk.	July 28	4	4	Do. 4 p.c. Red. Deb. 1911	71—73*	+1	70½—72
434,968	,,	June 29	—	4	Do. 4 p.c. Cons. Deb.	71—73	+2	..
160,000	10	Mar. 24	6	6	San Paulo 6 p.c. Pref.	7½—7¾	..	..
135,000	50	June 29	5	5	Do. 5 p.c. Red. Deb.	48—49	..	..
270,000	Stk.	Mar. 24	5⅜	5⅜	Sheffield A	99—101c	+2	..
419,968	,,	,,	5⅜	5⅜	Do. B	99—101c	+2	..
1,047,000	,,	,,	5½	5½	Do. C	99—101c	+2	..
90,000	10	May 26	4	6	South African	4—6	..	..
6,609,895	Stk.	Feb. 24	5	7	South Met. Ord.	102—104	+½	103½—103⅝
1,895,445	,,	July 14	3	3	Do. 3 p.c. Deb.	56—59*	..	58½—59
734,000	,,	Mar. 10	6½	6½	Do. 6½ p.c. Red. Db.	100—102	..	..
91,500	,,	Feb. 24	8½	8½	South Shields Con.	104—106d	..	..
1,348,795	,,	July 28	6½	6½	South Suburban Ord. 5 p.c.	102—105*	−2	103—105
388,837	,,	June 16	5	5	Do. 5 p.c. Deb.	92—95	..	94½
647,740	,,	Mar. 24	5	5	South'mpton Ord. 5 p.c. max.	74—77	..	..
191,275	,,	June 29	4	4	Do. 4 p.c. Deb.	71—74	..	..
250,000	,,	Feb. 24	7	7	Swansea 7 p.c. Red. Pref.	100—102	..	..
200,000	,,	June 16	6½	6½	Do. 6½ p.c. Red. Deb.	100—102	..	..
180,000	,,	July 28	7½	7½	Tottenham District A 5 p.c.	105—108*	−2	..
862,275	,,	,,	6½	6½	Do. B 8½ p.c.	89—92*	−2	91
150,000	,,	,,	5½	5½	Do. 5½ p.c. Pref.	95—98*	−2	..
181,255	,,	June 16	4	4	Do. 4 p.c. Deb.	70—73	..	..
250,351	,,	Mar. 10	5	5	Tynemouth Con. and New	71—73d	+½	..
239,094	,,	Mar. 10	6½	6½	Uxbridge, Maidenhead, & Wycombe 5 p.c.	85—90	..	86
88,380	,,	,,	5	5	Do. 5 p.c. pref.	83—88	..	..
					Wandsworth, Wimbledon, and Epsom—			
30,000	,,	July 14	8½	8½	Wandsworth A 5 p.c.	117—122	..	..
355,098	,,	,,	7	7	Do. B 3½ p.c.	100—105	..	..
432,535	,,	,,	5/19/0	5/19/0	Do. C & D New	88—93	..	..
382,000	,,	,,	6⅜	6⅜	Do. Wimbledon 5 p.c.	98—103	..	..
98,930	,,	,,	7½	7½	Do. Epsom 5 p.c.	100—105	..	..
200,000	,,	,,	5	5	Do. 5 p.c. Pref	83—88	..	..
98,416	,,	June 29	3	3	Do. 3 p.c. Deb.	52—55	..	..
284,743	,,	,,	4	4	Do. 4 p.c. Deb.	73—76	..	..

Quotations at:—a.—Bristol. b.—Liverpool. c.—Nottingham. d.—Newcastle e.—Sheffield. * Ex. div.
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CONTENTS.

EDITORIAL NOTES.

Gas Amalgamations and Municipal Embroidery 319
The Secondary Products Limitation . . . 320
The Part of Gas Workers 320
"E.D.A. Circle Campaign" 321
Gas-Works Effluents—Coal Outputs—Fuel Research Expenditure—Trade Disputes Act—British Association—Combining Business and Pleasure—Trade Unions and Russia. 322

Personal 323
Forthcoming Engagements 323
Electricity Supply Memoranda 323
Institution of Public Lighting Engineers—Fourth Annual Conference and Exhibition, Brighton, Sept. 12 to 15 325
Safety in Mines Research Board 325
Irish Association of Gas Managers . . . 325
Better Forms of Rates for Gas—A Discussion of Rate-Making Based on Allocated Costs . 326
Factories and Workshops Report for 1926 . 328
Electrostatic Precipitation of Tar 329
Canadian Gas Association—Proceedings at the Toronto Convention 330
The Variation of the Hutchinson Consistency of Tars with Temperature. By H. M. Spiers, M.A., B.Sc., F.I.C. 331
"New World" Cooker Improvements . . 332
The Reavell Portable Air Plant—An Aid to Main Laying. 333
City of Birmingham Gas Department Chemical Staff 333
An Examination of the Products of Combustion from Coal Gas Flames. By Hamilton Davies, B.Sc., and Harold Hartley, D.Sc.. 334

CORRESPONDENCE.

"Cheap Gas" 337

REGISTER OF PATENTS.

Valves—Groves, W. W. 338
Distillation of Coal, &c.—Davidson, T. M. . 338
Vertical Retort Settings—West, F. J. & E., and West's Gas Improvement Co., Ltd. . 338
Treatment of Gases with Liquids—Pease, E. L. 338
Gas Cookers—Marwood, F. T. 339
Dry Meters—Thorp, F., and Parkinson & Cowan (Gas Meters), Ltd. 339
Distillation of Carbonaceous Materials—Salermo, Ltd., and Salerni, E. M. . . . 339
Applications for Patents 339

PARLIAMENTARY INTELLIGENCE.

South Staffordshire Mond Gas Bill: The New Products Clause—Special Report by the Unopposed Bills Committee 339

MISCELLANEOUS NEWS.

An Electrical Fault and an Explosion at Acton 340
Glasgow Gas Price—A Substantial Reduction 340
Gas Regulation Act Applications 340
Cheap Gas—Further Instances 340
Parkinson and W. & B. Cowan, Ltd.—Annual General Meeting 341
Institution of Chemical Engineers—Examination Questions for Associate-Membership . 341
Summer Outing of the Welsbach Light Company 341
Coal Trade Reports—
North-East Coast 342
Yorkshire and Lancashire 342
Midlands 342

MISCELLANEOUS NEWS—(*continued*).

Current Sales of Gas Products 342
Trade Notes 342
Contracts Open 342
Stock Market Report 345

PARAGRAPHS.

"Gas Salesmen's Day, 1927"—"A Standardized System of Gas Cooker Construction" 325
Selection and Placing of Employees . . . 327
British Standard Specifications for Paints, &c. 332
Ballymena Gas-Works Position. 340
Public Lighting in Liverpool—Reduction at Elland—Cupar's Lowest Gas Price . . . 342
Year's Working at Morecambe—Reduction at Retford—Reduction in Price at Ross—Reading Gas Company's Capital Issue—Croydon Gas Company's Dividends—Standard Ammonia—Extensions at Blackpool—Airdrie Corporation Gas Department—Administration at Belfast—Wirksworth Gas Cheaper—Seaford Gas Company, Ltd.—Centenary of Gas at Doncaster—Reduction in Price of Gas at Reading—Montrose Gas Dividend—Cleveland Gas Company—West Bromwich Accounts—Good Working at Peterhead—Increased Output at Weymouth—Results at Bo'ness—Delayed Extensions at Omagh—Bristol Gas Company's Sports 343
Bristol's Gas—Cheaper Gas at Cambridge—Glastonbury Gas Department—Loss at Hebden Bridge—Extensions at Plymouth—Public Lighting at Alsager—New Scale of Charges at Todmorden—Grantham Gas Company—Newcastle (Staffs.) Gas Undertaking—Maidstone Gas Company—Shipley Gas-Works Results—Bridport Gas Company, Ltd.—Results at Accrington . . . 344

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For List of "JOURNAL" Advertisers, see p. 350.

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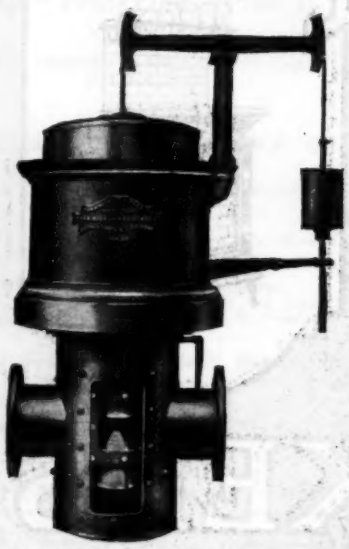

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